

Attachment 2 to the Administrative Order

**REMEDIAL DESIGN/REMEDIAL ACTION
(RD/RA) STATEMENT OF WORK**

Western Groundwater Operable Unit (OU-3)

AEROJET SUPERFUND SITE

SACRAMENTO COUNTY, CALIFORNIA

August 07, 2002

TABLE OF CONTENTS

I.	Introduction	1
II.	Summary of the OU-3 Remedial Action	1
III.	Performance Standards	2
	A. Listing of Performance Standards	2
	B. Compliance with Performance Standards	3
	C. Groundwater Extraction, Treatment and Discharge	5
	D. Institutional Controls	7
	E. Replacement Water Supply	8
	F. Groundwater Management Zone Plan	8
	G. Site Security	8
	H. Dust Control	8
IV.	List of Deliverables and Other Tasks	8
	A. Compliance and Sentinel Well Network Plan	9
	B. Additional Wells	9
	C. Compliance and Sentinel Well Installation Complete Report	10
	D. Remedial Design/Remedial Action Work Plan	11
	E. Remedial Design	14
	F. Remedial Action	17
	G. Operation and Maintenance	20
	H. Compliance Monitoring Plan	22
	I. Obligation to Perform Further Response Actions and Submission of Plans	23
	J. General Monitoring Plan	23
	K. Performance Evaluation Reports	25
	L. Quarterly Compliance Monitoring Reports	26
	M. Supporting Plans	26
	N. Certification of All Work Complete Report	30
	O. <i>In-Situ</i> Bioremediation Treatability Evaluation	31
	P. Institutional Controls	31
	Q. Replacement Water Supply	32
	R. Groundwater Management Zone Plan	38
	S. Off-Site Rule Disposal Notification	38
	T. Remedy Review	38
V.	Schedule for Major Deliverables and Other Tasks	39
VI.	References	48

ATTACHMENTS

Contaminants of Concern and Cleanup Levels	Attachment 1
Extent of Contamination and Approximate Remediation Well Locations	Attachment 2
Surface Water Discharge Limitations	Attachment 3
Applicable or Relevant and Appropriate Requirements (ARARs)	Attachment 4

**STATEMENT OF WORK FOR
REMEDIAL DESIGN AND REMEDIAL ACTION
ATTACHMENT 2 TO THE ADMINISTRATIVE ORDER**

Western Groundwater Operable Unit
Aerojet Superfund Site, Sacramento, CA

I. Introduction

This Statement of Work (SOW) describes the activities the Respondents must perform in order to design, construct, operate, maintain, monitor, and evaluate the Remedial Action for the Western Groundwater Operable Unit (OU-3), as described in the Western Groundwater Operable Unit OU-3 Record of Decision (ROD), dated July 20, 2001. This SOW is Attachment 2 to the Administrative Order for Remedial Design and Remedial Action for the Western Groundwater Operable Unit (Administrative Order).

The OU-3 addresses a several-mile-long area of Contaminated Groundwater extending beneath portions of the western perimeter of the Aerojet Property and the unincorporated City of Rancho Cordova in Sacramento County, California. The Chemicals of Concern (COC) in the groundwater include the fifteen chemicals set forth in Attachment 1 (Contaminants of Concern and Cleanup Levels) of this SOW.

The United States Environmental Protection Agency (EPA) is the lead Agency for the Administrative Order. The California Department of Toxic Substances Control (DTSC) and the California Regional Water Quality Control Board for the Central Valley Region (CVRWQCB) will represent the State of California in providing state review comments. An individual Agency or a joint Agency response will be provided to Respondents. As lead Agency, the EPA will resolve any differences in Agencies' responses to Respondents. The term "Agencies" shall mean EPA, DTSC and CVRWQCB.

The Agencies intend to review deliverables to assess whether or not the Remedial Action will achieve the Performance Standards set forth in Section III (Performance Standards) of this SOW. Reviews by the Agencies or EPA's approval of a task or deliverable shall not, however, be construed as a guarantee of the adequacy of such task or deliverable.

The definitions set forth in Section VI (Definitions) of the Administrative Order shall apply to this SOW unless expressly provided otherwise herein.

II. Summary of the OU-3 Remedial Action

The ROD requires the Remedial Action to provide sufficient hydraulic control to prevent the vertical and horizontal migration of the Contaminated Groundwater [defined as groundwater at or exceeding the cleanup levels specified in the latest revision to Attachment 1 (Contaminants of Concern and Cleanup Levels) of this SOW] at both the Aerojet Property containment boundary and the containment boundary at the downgradient leading edge of the maximum extent of Contaminated

Groundwater within OU-3. The aquifer between the on- and the off-property containment boundaries is to be remediated to the cleanup levels set forth in Attachment 1 (Contaminants of Concern and Cleanup Levels) of this SOW. To expedite the cleanup, additional extraction wells will be installed in the central portion of the OU-3 Contaminated Groundwater. Attachment 2 (Extent of Contamination and Approximate Remediation Well Locations) of this SOW shows the approximate number and placement of extraction wells, which may be changed with the EPA's approval, if Remedial Design (RD) modeling shows that other locations would be more efficient in expediting the remedy or *in-situ* bioremediation is added to the remedy and the EPA assesses it is more beneficial to expedite the remedy.

Compliance monitoring wells shall be installed in strategic locations to verify that extraction of the groundwater is sufficient to meet Performance Standards of this SOW in all layers of the water-bearing rock or aquifer. The descriptions of aquifer layers A through F are contained in the Remedial Investigation/Feasibility Study (RI/FS) for the Western Groundwater Operable Unit (OU-3). Attachment 2 (Extent of Contamination and Approximate Remediation Well Locations) of this SOW depicts the approximate extent of the plume. The EPA shall approve the locations and specifications for the compliance monitoring wells.

Respondents shall also install wells, as needed, to provide an early warning system (sentinel wells). Sentinel wells are to be located and monitored in order to detect movement of Contaminated Groundwater toward water supply wells that are not contaminated, and to provide sufficient time for water supply replacement.

In addition, Respondents shall provide short- and long-term replacement water and Institutional Controls (ICs) to protect the public from contaminated groundwater and perform all the necessary work to implement the Remedial Action (RA) and achieve Section III (Performance Standards) of this SOW.

III. Performance Standards

As specified in the Administrative Order, Respondents shall meet all Performance Standards. The Performance Standards are outlined in subparagraph (A) below.

A. Listing of Performance Standards

1. The Remedial Action Objectives (RAOs) specified in the ROD as follows:
 - a. Protect human health and the environment from exposure to Contaminated Groundwater,
 - b. Achieve full containment of the Contaminated Groundwater to minimize future migration of contaminants until cleanup is accomplished,
 - c. Protect public water supply wells through short-term and long-term contingency plans including providing alternative water supplies, and
 - d. Restore groundwater to beneficial uses in OU-3 between the on-property and off-property extraction systems, and

2. The requirements, limits, and or criteria specified in the following items:
 - a. Attachment 1 (Contaminants of Concern and Cleanup Levels) of this SOW,
 - b. Attachment 3 (Surface Water Discharge Limitations) of this SOW including National Pollution Discharge Elimination Permit (NPDES) limits for OU-3,
 - c. Attachment 4 (Applicable or Relevant and Appropriate Requirements) of this SOW,
 - d. Short-Term Water Replacement Contingency Plan,
 - e. Long-Term Water Replacement Contingency Plan,
 - f. Groundwater Management Zone Plan,
 - g. Specified Institutional Controls of this SOW, and
 - h. Any additional Performance Standards developed in Section V (Schedule for Major Deliverables and Other Tasks) of this SOW.

B. Compliance with Performance Standards

The ROD requires that the Remedial Action provide sufficient hydraulic control in all layers of the contaminated aquifer to meet the Performance Standards. Respondents shall demonstrate performance compliance through the deliverable documents acceptable to the EPA as specified in Section V (Schedule for Major Deliverables and Other Tasks) of this SOW. The Remedial Action shall prevent further vertical and horizontal migration of COC in all layers of the aquifer past two containment boundaries, one to be established at the downgradient leading edge of the maximum extent of Contaminated Groundwater within OU-3 and the other set on-property at the eastern edge of OU-3. The Remedial Action shall provide sufficient vertical and horizontal hydraulic control to remediate the aquifer in OU-3 to achieve the cleanup levels set forth in Attachment 1 (Contaminants of Concern and Cleanup Levels) of this SOW between the on-property and off-property extraction systems. The priorities for the remedy components are as follows:

1. The first priority is to contain the Contaminated Groundwater off-property at the containment boundary to be established downgradient of the leading edge of the maximum extent of Contaminated Groundwater in all layers of the aquifer using Pump and Treat (P&T) remediation. Any phased implementation of the off-property containment, using centralized or decentralized treatment, shall address in the work plan the interface, schedule and coordination to insure achieving the remedy Performance Standards.
2. The second priority is to modify the existing combined Groundwater Extraction and Treatment (GET) E/F Facility, if this Work is not already completed under the existing Partial Consent Decree in Civil Action No. CIVS-86-0063-EJG and CIVS-86-0064-EJG consolidated. The GET E/F modification shall contain all Contaminated Groundwater at the Aerojet Property boundary in all layers of the aquifer which flow off-property within OU-3. The modification shall also replace the existing reinjection field with extraction wells. Existing reinjection wells 4014, 5050, 5045, 5100, 5080, 5085, 5090, and 5095 shall be replaced with extraction wells and destroyed unless used for monitoring purposes in accordance with State of California (State) requirements.

3. The third priority is to remove the COC to the cleanup levels in all layers of the aquifer between the on-property containment boundary and the off-property containment boundary to restore the aquifer to its beneficial use as a drinking water aquifer.
4. The fourth priority is to expedite remediation of the aquifer and prevent further degradation of Layers D and E off-property, as set forth in Attachment 2 (Extent of Contamination and Approximate Remediation Well Locations) of this SOW, by adding extraction wells E2, C11 through C14, and D1 through D4, together with service connections and any needed additional treatment capacity, unless modified with EPA's approval.

Respondents shall also provide documentation acceptable to the Agencies that the extraction wells will operate in a manner that ensures compliance with the Performance Standards. The OU-3 remedy will operate together with current and pending groundwater remedies that are to the northwest and southwest of OU-3 (DTSC and CVRWQCB Orders for the Inactive Rancho Cordova Test Site [IRCTS] and the pending Operable Unit 5 for Perimeter Groundwater) to contain Contaminated Groundwater in all layers of the aquifer on-property as an integral part of the remedy. Unless otherwise agreed to by the EPA, the SOW for OU-3 shall require any modifications to the OU-3 remedy, necessary over the life of the remedy, to insure that OU-3 continues to interact with these remedies to prevent Contaminated Groundwater at or above the cleanup levels from entering OU-3. Respondents shall provide adequate monitoring compliance and evaluation data to the Agencies at a sufficient number of monitoring wells within OU-3 to substantiate that the remedies at the northwest and southwest boundaries of OU-3 are interacting with OU-3 remedies to meet the Performance Standards of this SOW.

Respondents shall conduct quarterly sampling at the compliance monitoring wells to ensure compliance with the applicable Performance Standards. Results shall be reported in the Quarterly Compliance Monitoring Reports as discussed in Section IV(L) (Quarterly Compliance Monitoring Reports) of this SOW. Contaminant concentrations at the compliance monitoring wells and potentiometric measurements from appropriate monitor well pairs that help to demonstrate capture will be the primary criteria for evaluating compliance. Respondents shall ensure that groundwater containment actions will be implemented sufficiently upgradient of the compliance monitoring wells to provide enough of a buffer zone to allow additional actions to be taken, if necessary, to ensure compliance with the Performance Standards of this SOW. The EPA may require adjustments to the system as warranted by either noncompliance with Performance Standards of this SOW at a compliance monitoring well, or water level elevation differences that show insufficient hydraulic control. Examples of adjustments which may be required by the EPA include installation of additional extraction wells, provision for additional treatment capacity, and changes in extraction rates.

C. Groundwater Extraction, Treatment, and Discharge

Unless modified during the design phase with EPA's written approval, the groundwater treatment train shall be appropriate to remove the contaminants below the cleanup levels in the extracted groundwater streams being treated as follows: perchlorate, nitrite and nitrate shall be treated using the Aerojet-developed equivalent biological treatment process or an Ion Exchange (IC) system approved by DHS if used for human consumption with any concentrated waste generated as part of the IC process disposed of at an approved Resource Conservation and Recovery Act (RCRA) disposal facility; N-Nitrosodimethylamine (NDMA) and Volatile Organic Compounds (VOCs) shall be treated using ultraviolet light; as needed to meet discharge requirements, a final polishing step shall be used for VOCs; and any treatment units needed to remove pollutants identified during the NPDES permit process for OU-3. The RD shall assess the number of and siting for treatment facilities and separation of treatment streams. The groundwater treatment process shall meet current State and Federal Air Regulations. If after the treatment systems are constructed, Respondents develop, sell or lease their property within or directly adjacent to OU-3, including the Inactive Rancho Cordova Test Site (IRCTS), Respondents shall review current State and Federal Air Regulations and make any necessary modification to the on-property treatment components to comply with the current regulations, such as modifications necessary due to increased population density and proximity.

Disposal/discharge of the treated groundwater must comply with the ARARs contained in Attachment 3 (Surface Water Discharge Limitations) of this SOW and the NPDES limits for OU-3. Any groundwater treatment waste discharged to a sewer shall meet the requirements of the Public Owned Treatment Works (POTW). If wastes from treatment facilities are disposed of from OU-3 other than to a POTW, Respondents shall comply with the Off-Site Rule contained in Section 300.440 of the National Contingency Plan (NCP) for the disposal of CERCLA generated waste. Respondents shall provide Off-Site Rule Disposal Notification to the EPA and the receiving state in accordance with Section IV(S) (Off-Site Rule Disposal Notification) of this SOW.

Following treatment, extracted groundwater can either be provided to local water purveyor/s or discharged to surface water so that it can be available for reuse by the community affected by the groundwater contamination within OU-3, if necessary. Any introduction of treated groundwater into a public water supply is an off-site activity that must comply with all State and Federal requirements in effect at the time of the activity and must be permitted by California Department of Health Services (CADHS) and accepted by the receiving water purveyor/s.

Respondents shall design, install, operate, maintain and augment as necessary groundwater P&T Systems to contain and restore groundwater to meet all Performance Standards set forth in the ROD and this SOW. Respondents shall install, operate and maintain the P&T Systems which shall be a network of wells designed to completely contain on- and off-property Contaminated Groundwater and to remove COC within the lateral and vertical extent of the Contaminated Groundwater plume in all layer of the aquifer between the on- and off-property extraction systems. The final number of wells,

placement and extraction rates shall be determined solely at the discretion of the EPA. The extraction, treatment, operation and maintenance of groundwater treatment systems shall comply with the following additional requirements:

1. Under all anticipated operating conditions, the P&T Systems and their components shall be designed, operated, and maintained to reduce the concentrations of contaminants in the aquifer to below the cleanup levels set forth in Attachment 1 (Contaminants of Concern and Cleanup Levels) of this SOW. The groundwater extracted to achieve containment shall be remediated to the cleanup level necessary for its reuse. Surface water discharge shall meet the most stringent condition set forth in either Attachment 1 (Contaminants of Concern and Cleanup Levels) of this SOW, Attachment 3 (Surface Water Discharge Limitations) of this SOW, or any supplemental limits in the NPDES permit for the discharge from OU-3. Respondents shall obtain an NPDES permit specific to the receiving waters for any surface water discharge from OU-3. Groundwater to be provided to a water purveyor/s shall meet the most stringent of either Federal Drinking Water or CADHS requirements.
2. The P&T Systems shall comply with Attachment 4 (Applicable or Relevant and Appropriate Requirements) of this SOW.
3. Extraction, treatment, and monitoring systems shall not cause the discharge of material that is odorous or causes injury, nuisance or annoyance to the public. P&T Systems shall also comply with applicable noise ordinances.
4. Respondents shall install and operate a monitoring program approved by the EPA to evaluate and ensure that construction and implementation of the Remedial Design complies with approved plans, design documents and Performance Standards set forth in this SOW.
5. Design, construction, and destruction of extraction and monitoring wells shall comply with the substantive portions of the State Water Well Standards contained in Bulletin 74-90 and any subsequent revision thereto.
6. The P&T Systems shall be maintained in accordance with good engineering practice with adequate spare parts to ensure minimal service outages. Unless otherwise agreed to by the EPA, each separate perchlorate biological surface treatment facility (except any individual well head treatment or portable units) used for the remedy shall be provided with one spare fluid bed reactor (FBR) of adequate capacity to allow for rotation of FBRs for maintenance and biological upset recovery. The spare FBR shall have all connection piping and components and be maintained in ready reserve. Well head treatment or portable units shall have provision for system replacement to prevent outages exceeding one week unless otherwise agreed to in writing by the EPA.

7. Respondents shall design the extraction wells and P&T Systems to be capable of pumping and treating sufficient quantities of groundwater to adequately contain and extract the entire Contaminated Groundwater in all layers of the aquifer.

Respondents may submit a request for review by the Agencies and EPA's approval to terminate the pumping of off-property extraction wells after demonstrating that the Performance Standards of this SOW have been achieved throughout all layers of the Contaminated Groundwater plume, in accordance with the Data Quality Objectives (DQOs) approved by the EPA. The on-property extraction wells in OU-3, which contain contamination on-property, can be removed from service only if source materials upgradient of OU-3 contributing to the Contaminated Groundwater have been remediated and the EPA concurs that there is no further need for the wells. Termination of any portion of the P&T Systems can only occur at the written direction of the EPA. The demonstration that DQOs have been achieved shall consist of at least three years of consecutive quarterly monitoring during which none of the COC exceeds any Performance Standards of this SOW in any of the wells in the monitoring network. Monitoring shall be conducted pursuant to the Sampling Analysis Plan (SAP) developed for OU-3.

If groundwater monitoring indicates that the concentration of a contaminant has increased above the aquifer cleanup standards after the groundwater restoration has been completed, Respondents shall reactivate the groundwater extraction treatment system upon written notice from the EPA to do so. Indication of an exceedance of any of the Performance Standards of this SOW may be based on a confirmed single monitoring event in any well.

D. Institutional Controls

Respondents shall execute the following listed Institutional Controls for OU-3 as further defined and described in Section IV(P) (Institutional Controls) of this SOW:

1. Respondents shall record with the County Recorder and implement a Declaration of Covenants and Environmental Restrictions Related to Groundwater, restricting access to Contaminated Groundwater from on-property land within OU-3.
2. If treated groundwater discharged to a direct potable reuse source will exceed the levels set forth in Table III(D)(1)(a) (SWRCP & LWRCP Trigger Levels) of Section IV(Q) (Replacement Water Supply) of this SOW at the point of entry to a water purveyor's system, Respondents shall provide formal Notification of Action Level Exceedance (NALE), on each occurrence, to CADHS, the Agencies and to water suppliers that could receive the water.
3. Respondents shall provide annual public notification of OU-3 Contaminated Groundwater as set forth in Section IV(P)(3) (Institutional Controls) of this SOW.

E. Replacement Water Supply

Respondents shall develop and submit for review by the Agencies and EPA's approval both a short-term water replacement contingency plan (SWRCP) and a long-term water replacement contingency plan (LWRCP), and perform chronic toxicity monitoring for any direct water supply discharge as further defined in Section IV(Q) (Replacement Water Supply) of this SOW.

F. Groundwater Management Zone Plan

Respondents shall create and submit for review by the Agencies and EPA's approval a Groundwater Management Zone Plan (GMZP) within OU-3 to maintain water levels and prevent interference with the remedy as further defined in Section IV(R) (Groundwater Management Zone Plan) of this SOW.

G. Site Security

Respondents shall fence and otherwise secure all Site remedy components to prevent access by the public to these components and to minimize potential vandalism during the performance of the Remedial Action. Warning signs with a telephone number to call for further information shall be posted along fencing protecting OU-3 components. Security components (fences, signs, locks, etc.) shall be maintained in good condition to perform their function until the EPA agrees they are no longer required. Security components shall be installed as construction progresses. On-property fencing will not be required if the existing perimeter fencing and security patrols remain in effect to protect on-property OU-3 components. However, if existing on-property boundary fencing is removed in the future, new fencing with warning signs to protect OU-3 remedy components shall be installed prior to removing the existing fencing.

H. Dust Control

Respondents shall ensure that no visible air emissions occur at or beyond facility fence lines at all times during the performance of the Remedial Action. Respondents shall implement dust control measures which are submitted for reviewed by the Agencies and approved by the EPA. Respondents shall take corrective measures to comply with local ordinances and regulations.

IV. List of Deliverables and Other Tasks

Respondents shall submit plans, specifications, and other deliverables for the Agencies' review, as specified below. One copy of each final document deliverable shall be provided to the Site Repositories in an unbound format suitable for reproduction; one copy shall be provided to the EPA, DTSC and CVRWQCB Project Coordinators and EPA's contractor; additional copies, if required, shall be provided. In addition, for any deliverable specified in this SOW or determined

during the course of the Work to require review or input of a water purveyor or another local, state or federal agency, Respondents shall provide additional copies at no charge. Information presented in color must be legible and interpretable when reproduced in non-color. Final deliverables shall also be provided to the Agencies in electronic Portable Document Format (PDF) unless otherwise directed by the Agencies. If requested by the Agencies, Respondents shall supply portions of final documents in modifiable electronic format. The Agencies shall be provided upon their request any computer modeling runs used by Respondents to generate deliverable along with any necessary software to run the applications which are not in the public domain.

Respondents shall implement quality control procedures to ensure the quality of all reports and documents submitted for review by the Agencies. These procedures shall include but are not limited to internal technical and editorial review; independent verification of calculations; and documentation of all reviews, problems identified, and corrective actions taken.

As described in Section XIV (EPA Review of Submissions) of the Administrative Order, the EPA may approve, disapprove, or require modification of each deliverable in Section IV (List of Deliverables and Other Tasks) of this SOW. Major deliverables that are described below shall be submitted according to the schedule in Section V (Schedule for Major Deliverables and Other Tasks) of this SOW.

A. Compliance and Sentinel Well Network Plan

Prior to installation of compliance and sentinel wells and in accordance with the schedule contained in Section V (Schedule of Major Deliverables and Other Tasks) contained in this SOW, Respondents shall submit for review by the Agencies and EPA's approval a Compliance and Sentinel Well Network Plan, describing the proposed locations and specifications of the compliance monitoring and sentinel wells. Compliance monitoring wells are those wells which will be used by the EPA to determine that Performance Standards of this SOW are being achieved such as hydraulic containment, concentration limits for the groundwater aquifer, and water supply well contamination limits. Sentinel wells are early warning system wells whose function is to provide sufficient time to address and prevent exceedances of the Performance Standards of this SOW at the compliance monitoring wells and early warning for uncontaminated water supply wells. All existing wells that may be used for compliance or sentinel purposes must be described in this Plan. Additionally, all proposed new compliance and sentinel wells must be described. Respondents shall demonstrate to EPA's satisfaction that each proposed compliance and sentinel well is appropriate for measuring compliance, as described in Section III (Performance Standards) of this SOW. The inclusion of the proposed sentinel well locations in the Compliance and Sentinel Well Network Plan is primarily for review purposes so that the Agencies may provide input on well locations.

This Plan shall include sampling procedures for confirming the adequacy of all proposed compliance and sentinel wells. The Plan shall provide for Respondents' sampling of each proposed compliance and sentinel well at least two times to demonstrate that each well is

suitable to be a compliance monitoring well. Additional confirmation sampling may be required for proposed compliance monitoring wells with initial indeterminate sampling results.

Respondents shall provide the Agencies a Notice of Start of Compliance and Sentinel Well Installation in accordance with the schedule contained in Section V (Schedule for Major Deliverables and Other Tasks) in the SOW.

B. Additional Wells

In addition to the installation of compliance and sentinel monitoring wells, Respondents shall also install additional wells as needed to:

1. further define the hydrostratigraphy, hydraulic conductivities, and for determining piezometric data;
2. further define the degree of hydraulic connection between layers of the aquifer; and
3. further define the extent of contamination that requires control or capture to meet the Performance Standards of the ROD.

The wells under this subsection (Additional Wells) will be referred to as Pre-Design Data Collection Wells. Although it is anticipated that some of these wells may also serve as compliance monitoring wells or sentinel wells, the majority of these wells are solely for the purpose of data collection. The scope of the necessary design-level investigations, including further details regarding data collection objectives and the appropriate iterative nature of data collection, shall be specified in the Compliance and Sentinel Well Network Plan.

C. Compliance and Sentinel Well Installation Complete Report

After review by the Agencies and EPA's approval of the Compliance and Sentinel Well Network Plan, Respondents shall submit a Compliance and Sentinel Well Installation Complete Report no later than the date specified in Section V (Schedule for Major Deliverables and Other Tasks) of this SOW, indicating the time at which compliance monitoring will begin. This report shall include all sampling results for all proposed compliance and sentinel wells, and the data must show concentration trends that adhere to the requirements for all compliance monitoring wells as outlined in the ROD and this SOW, i.e., demonstrate compliance with the RAOs. After EPA's approval of the Compliance and Sentinel Well Installation Complete Report, Respondents shall perform quarterly sampling of each well to ensure that the Performance Standards of this SOW are met in all layers of the aquifer. Respondents shall submit quarterly compliance monitoring reports, as required by the Compliance Monitoring Plan, described in Section IV(H) (Compliance Monitoring Plan) of this SOW. Monitoring frequency and reporting may be extended if determined to be appropriate by the EPA.

D. Remedial Design/Remedial Action (RD/RA) Work Plan

Respondents shall submit a RD/RA Work Plan to the Agencies for review in accordance with the schedule contained in Section V (Schedule of Major Deliverables and Other Tasks) contained in this SOW. The RD/RA Work Plan shall describe the management strategy for design and construction of the Remedial Action. The RD/RA Work Plan must be approved by the EPA and submitted in accordance with the schedule contained in Section IX (Work To Be Performed) of the Administrative Order. The RD/RA Work Plan shall include:

1. Updated Project Description

The RD/RA Work Plan shall include a description of the Work to be implemented by Respondents. The Work shall include a description of the location, installation, and monitoring of compliance and sentinel wells. The RD/RA Work Plan shall also include, where applicable, information on extraction locations; treatment technologies; discharge of the treated water (i.e., recipients, delivery locations, delivery pressures, and delivery rates); locations of major project components; existing equipment and facilities to be used as part of the Remedial Action; and other key aspects of the project. The RD/RA Work Plan shall briefly discuss the condition, anticipated longevity, and any limitations in the use of each existing facility, and shall provide for written quarterly progress reports. The RD/RA monthly progress report/s shall comply with Section XV (Progress Reports) of the Administrative Order and provide for the following: (a) describe the actions which have been taken toward achieving compliance with this Administrative Order during the previous quarter including quantitation of remedy achievement; (b) include a summary of all results of sampling and tests and all other data received or generated by Respondents or its contractors or agents in the previous quarter; (c) identify all work plans, plans and other deliverables required by this Administrative Order completed and submitted during the previous quarter; (d) describe all actions, including, but not limited to, data collection and implementation of work plans, which are scheduled for the next quarter and provide other information relating to the progress of construction, including, but not limited to, critical path diagrams, Gantt charts and Pert charts; (e) include information regarding percentage of completion, unresolved delays encountered or anticipated that may affect the future schedule for implementation of the Work, and a description of efforts made to mitigate those delays or anticipated delays; (f) include any modifications to the work plans or other schedules that Respondents has proposed to the Agencies or that have been approved by EPA; (g) include the status of the siting and permitting for the remedy components, including schedules for completion, status and pending actions for the siting of all components of the remedy including extraction and monitoring wells, treatment facilities, distribution piping, any surface water discharge point/s and any permitting for system components for drinking or non-potable use of treated groundwater or requirements for discharge of the treated groundwater to land or surface water; and (h) describe all activities undertaken in support of the Community Relations Plan during the previous quarter and those to be undertaken in

the next quarter. If requested by EPA or the State Agencies, Respondents shall also provide briefings for EPA and the State Agencies to discuss the progress of the Work. The quarterly reporting frequency may be extended by EPA. Respondents shall perform the necessary tasks including coordination efforts among regulatory Agencies, water purveyors, landowners and all other parties, public meetings, and presentations to achieve the OU-3 remedy.

2. Description of the Responsibility and Authority of All Organizations and Key Personnel Involved With the Remedial Action

The RD/RA Work Plan shall include a description of the responsibilities and qualifications of key personnel expected to direct or play a significant role in the Remedial Design, Remedial Action, or Operation and Maintenance of the OU-3 Remedy, including Respondents' Project Coordinator, Designer, Construction Contractor, Construction Quality Assurance personnel, and Resident Engineer. The Work Plan shall define lines of authority and provide brief description of duties.

3. Updated Schedule and Meetings

The RD/RA Work Plan shall identify the initiation and completion dates for each required design activity, construction activity, inspections and deliverable required by the Administrative Order and this SOW. The RD/RA Work Plan at a minimum shall be consistent with the schedule included as Section V (Schedule for Major Deliverables and Other Tasks) of this SOW or an expedited schedule for phased implementation to achieve cleanup sooner. The Work Plan shall also identify the approximate timing of meetings and other activities which may require the Agencies' participation, but are not identified in Section V (Schedule for Major Deliverables and Other Tasks) of this SOW.

The schedule shall provide for monthly coordination meetings that may be decreased in frequency as deemed appropriate by the EPA after consultation among the Agencies. The coordination meetings shall address project status, problems, solutions, and schedule. Respondents shall prepare and distribute coordination meeting summary minutes to the Agencies in accordance with the schedule contained in Section V (Schedule for Major Deliverables and Other Tasks) of this SOW after any meeting to document all decisions made, issues outstanding, schedule changes, planned follow up, and assignments.

4. Contracting Strategy

The RD/RA Work Plan shall briefly describe the planned contracting strategy, including a brief description of the process for evaluation and approval of construction changes, for review by the Agencies and EPA's approval of significant changes.

5. Plans for Satisfying All Permitting Requirements and Acquiring Property, Leases, Easements, or Other Access.

The RD/RA Work Plan shall list all permits, approvals, Memorandums of Understanding (MOU), access or use agreements, property development or acquisition, leases, and easements required for implementation of the Remedial Action (extraction and monitoring wells, treatment facilities, distribution piping, and any surface water discharge point/s).

Where normally required, permits must be obtained for all off-site activities, such as permits from the CADHS for domestic use of treated water. Respondents is not required to obtain permits for on-site remedial activities, but must comply with all substantive requirements, including local building codes. If permits will not be obtained for an on-site activity where a permit is normally required, Respondents shall describe all consultative or coordination activities planned to identify and satisfy the substantive requirements. Discharges to water bodies off-site shall be subject to NPDES permitting.

6. Design, Construction, and Operation of the Remedial Action.

The RD/RA Work Plan shall describe the roles and responsibilities of Respondents, participating water producers and regulatory Agencies, and other parties expected to play a significant role in the design, construction, or operation of the Remedial Action. The Work Plan shall summarize and provide copies of MOUs and draft or final agreements between Respondents and water producers and any third parties expected to participate in implementation of the Remedial Action or to receive water that is, or contains, water extracted as part of the Remedial Action. If legally-binding agreements are not in place, the Work Plan shall describe commitments made to date and planned efforts to secure necessary commitments, including a schedule. If the participation of a third party is uncertain, the Work Plan shall describe alternatives to be implemented in the event that the party does not fulfill its planned role. Possible third party roles include agreeing to the use of existing equipment (e.g., groundwater extraction wells, water treatment facilities, pipelines, groundwater recharge facilities), treatment facilities operation, and acceptance of treated groundwater.

7. Identification of Any Concerns About the Quantity, Quality, Completeness, or Usability of Water Quality or Other Data Upon Which the Design Will Be Based

Respondents shall describe in the RD/RA Work Plan additional data collection efforts, if any, required for completion of the Remedial Design. Respondents shall consider whether any data are needed to verify that critical design assumptions remain valid (e.g., the areas of Contaminated Groundwater requiring hydraulic containment). If additional data are required, Respondents shall propose a schedule amendment of the OU-3 Sampling and Analysis Plan (or Addendum) and implementation of the Plan. At a minimum, Respondents shall address the following: 1) interaction of OU-3 remedy with existing and pending groundwater remedies bordering OU-3 to the northwest and southwest to contain contamination in all layers of the aquifer on-property; 2) ensuring that the on-property containment boundary contains the Contaminated Groundwater in all layers of the aquifer that flow off-property (e.g., Layers A and B of the aquifer and contamination west of GET D and the American River GET); 3) optimization of extraction well locations to prevent

further degradation of Layers D and E off-property; and 4) modification of the remedy to add *in-situ* bioremediation through an Explanation of Significant Differences pending results of the pilot and evaluation report.

8. A Description of Planned Community Relations Activities to Be Conducted During Remedial Design or Remedial Action

In accordance with Paragraph 47 (Work to be Performed) of the Administrative Order, Respondents shall cooperate with the Agencies in providing to the public information regarding the remedial work. As requested by the Agencies, Respondents shall aid in the preparation of such information and dissemination to the public. Respondents shall participate in public meetings which may be held or sponsored by the Agencies to explain activities at or relating to the Site (e.g., preparation of drawings, visual aids, presentations to existing Community Advisory Groups, presentations to permitting or reviewing authorities, obtain and pay for adequate meeting room space including any need insurance requirements, assistance in mailing list updates, and public meetings support for any amendment of the proposed plan/ROD including paying for stenographer to prepare meetings transcript both draft for EPA review and comment and final of transcript (6 hard copies and electronic version), and technical support as requested for response to public comment, etc.).

9. Updates to the RD/RA Work Plan and Periodic Reporting to the Agencies

The RD/RA Work Plan shall describe provisions for reporting progress to the Agencies consistent with the schedule included in Section V (Schedule for Major Deliverables and Other Tasks) of this SOW or an expedited schedule for phased implementation to achieve cleanup sooner and the Compliance Monitoring Plan to be prepared in accordance with Section IV(H) (Compliance Monitoring Plan) of this SOW. The RD/RA Work Plan shall also describe how the Work Plan will be updated as needed to document changes, provide for possible phased implementation, or provide information not available at the time the Work Plan and the quarterly progress report are submitted.

If any of the information required is not known at the time the RD/RA Work Plan must be submitted, and omitting the information from the Work Plan will not prevent compliance with any other requirements of this SOW, Respondents may submit the information at a later date. If any information is omitted, Respondents shall note in the Work Plan that the missing information was not available and specify when it will be submitted.

E. Remedial Design

Remedial Design activities shall include the preparation of clear and comprehensive design documents, construction plans and specifications, and other design activities needed to implement the Work and satisfy Performance Standards set forth in the ROD and this SOW. All plans and specifications shall be developed in accordance with relevant portions of the

latest revision of the EPA's Superfund Remedial Design/Remedial Action Handbook (EPA 540/R-95/059), and in accordance with the schedule set forth in Section V (Schedule for Major Deliverables and Other Tasks) of this SOW.

1. Conceptual/Preliminary Remedial Design

Respondents shall submit a Conceptual/Preliminary Remedial Design for review by the Agencies in accordance with the schedule contained in Section V (Schedule of Major Deliverables and Other Tasks) of this SOW. The EPA's approval is required before proceeding with further design work, unless the EPA agrees otherwise. Unless modified by the EPA, the Conceptual/Preliminary Design submittal shall include, at a minimum, the following:

- a. A detailed Design Basis Report that presents and justifies the concepts, assumptions, standards, and preliminary interpretations and calculations used in the design. The Design Basis Report shall include:
 - (1) Volume or flow rate of water, brine, air, sludge, and other media requiring treatment or disposal;
 - (2) A summary of water quality or other data to be used during design along with an analysis of whether the data confirm assumptions, recommendations, or conclusions made to date for OU-3;
 - (3) Assumed treatment facilities influent quality over the design life of the treatment systems, with a description of the methodology used to develop the influent quality estimate (including discussion of the likelihood and magnitude of short-term and long-term changes in influent concentrations);
 - (4) An explanation of how Performance Standards of this SOW for each layer of the aquifer will be met;
 - (5) Discussion of any proposed or anticipated State or Federal drinking water or ambient water quality standards that would impact the design;
 - (6) Filtration, disinfection, corrosion control, or other treatment requirements in addition to removal of COC;
 - (7) Treatment technologies and/or treatment trains (for all media and byproducts) and initial treatment process flow diagrams;
 - (8) Preliminary sizing of treatment systems and other Remedial Action components;
 - (9) Expected treatment facilities removal capacity for all groundwater COC;
 - (10) Delivery locations, rates, and pressures for the treated groundwater, and other conveyance system assumptions for discharging treated groundwater for water supplies, including siting of systems;
 - (11) Assessment of impact of the remedy on groundwater levels and measures for minimization of impact;
 - (12) The degree of automation, planned level of operator oversight and emergency notification;
 - (13) System control strategy, including the level of reliability (life cycle service analysis and main component replacement times analysis), redundancy, or specific

damage prevention features needed in each major component of the Remedial Action to respond to seismic events, power outages, equipment failure, system maintenance, operator error, and deviations from design assumptions;

(14) Listing and discussion of siting criteria for new extraction wells, treatment facilities, pipelines, and other facilities, along with preliminary locations and alignments; and

(15) Estimate the distance from each proposed extraction location to the location assumed in computer model simulations that were completed in support of the OU-3 containment Remedial Action. Outline computer modeling activities, to achieve model calibration after monitoring wells are installed and to verify the effectiveness of the actual extraction well locations.

- b. An updated construction schedule for construction and implementation of the Remedial Action which identifies timing for initiation and completion of all critical path tasks.
 - c. An updated list and copies of permits, any regulatory Agencies' approvals in addition to those of the EPA's, MOUs, access or use agreements, easements, leases, and properties developed or acquired to date; copies of permits, approvals, and agreements not previously supplied to the Agencies; and activities and schedules for obtaining outstanding items required before start of construction (e.g., for use of existing facilities or disposition of the treated water).
 - d. Preliminary plan, specifications, and drawings of groundwater extraction, treatment, conveyance, and monitoring systems.
 - e. Sampling and Analysis Plans (SAP) in accordance with Section XVI (Quality Assurance, Sampling, and Data Analysis) of the Administrative Order, and Section IV(M)(1) (Sampling and Analysis Plans) of this SOW.
 - f. Health and Safety Plans (HSP) in accordance with Paragraphs 51 (Remedial Design) and 58 (Remedial Action) of the Administrative Order, and Section IV(M)(3) (Health and Safety Plans) of this SOW.
 - g. Construction Quality Assurance Plan in accordance with Paragraphs 52 and (Remedial Design) and Section IV(M)(2) (Construction Quality Assurance Plan) of this SOW.
 - h. Construction Contingency Plan in accordance with and Section IV(M)(4) (Contingency Plans) of this SOW.
2. Prefinal/Final Remedial Design

Respondents shall submit the Prefinal Remedial Design when the design effort is complete in accordance with the approved schedule contained in Section V (Schedule of

Major Deliverables and Other Tasks) of this SOW. The Prefinal Design shall fully address all Agencies' comments provided by the EPA on the Conceptual/Preliminary Design Report, and if not previously addressed, be accompanied by a memorandum indicating how the comments were incorporated into the Prefinal Design. The Prefinal Design documents shall be certified by a Professional Engineer registered in the State of California.

The Prefinal Remedial Design shall serve as the Final Remedial Design if the Agencies have no further comments and EPA provides its approval. The Prefinal Remedial Design submittals shall include a capital and operation and maintenance cost estimate; reproducible drawings and specifications; and a complete set of construction drawings in full and one-half size reduction. The Final Remedial Design should also include a schedule for completion of construction including inspection certifications to establish Construction Criteria of this SOW are met.

3. GET E/F Modification

Respondents is proceeding to modify the existing GET E/F Facility to achieve on-property groundwater boundary containment needed for the OU-3 remedy under the existing Partial Consent Decree in Civil Action No. CIVS-86-0063-EJG and CIVS-86-0064-EJG consolidated. If the GET E/F modifications have been completed prior to entry of this Administrative Order and meet the provisions of this SOW, Respondents shall only be obligated to provide each of the Agencies with a set of reproduceable as-built drawings, a hard copy of the as-built drawing signed and stamped by a Professional Engineer, and an electronic PDF file of the Final Design documents for the GET E/F facility modification. Any completed GET E/F modifications which do not meet the Performance Standards of this SOW shall be modified as needed to meet the Performance Standards.

F. Remedial Action

Respondents shall implement the Remedial Action. During the design period, in preparation for implementation of the Remedial Action and in accordance with Section IV(M) (Supporting Plans) and Section V (Schedule for Major Deliverables and Other Tasks) of this SOW, Respondents shall submit to the Agencies for review a Construction SAP with Field Sampling Plan and QAPP; Construction Quality Assurance Program Plan; Construction Health and Safety Plan; Construction Contingency Plan; and any needed updates to the RD/RA Work Plan.

Unless otherwise approved by the EPA, Respondents shall not begin any phase of the construction until after the EPA has approved its Final Remedial Design, Construction Contingency Plan, and Construction SAP. Field changes to the Remedial Action, as set forth in the RD/RA Work Plan and Final Design, shall not be undertaken without review by the Agencies and the EPA's approval. All Work on the Remedial Action shall be documented in enough detail to produce as-built construction drawings after the Remedial Action is complete. Review by the Agencies and/or EPA's approval of submittals does not guarantee

that the Remedial Action, when constructed, will meet the Performance Standards of this SOW.

1. Remedial Action Work Plan

Respondents shall not be required to submit a separate Remedial Action Work Plan. Instead, Respondents shall provide supplemental information as necessary to update the RD/RA Work Plan.

2. Pre-Construction Meeting

A pre-construction meeting shall be held after selection of the construction contractor but before initiation of construction in accordance with the schedule contained in Section V (Schedule of Major Deliverables and Other Tasks) of this SOW. The meeting shall include Respondents's representatives and interested federal, state and local regulatory agency personnel. At the meeting, Respondents shall describe the roles, relationships, and responsibilities of all parties; review the work area security and safety protocols; review any access issues; review the construction schedule; and review the construction quality assurance procedures.

Respondents shall document the meeting results in a Pre-Construction Meeting Report and submit the report in accordance with the schedule contained in Section V (Schedule of Major Deliverables and Other Tasks) of this SOW. Respondents shall submit the report to all parties in attendance, and shall include the names of people in attendance, issues discussed, clarifications made, and action items and due dates.

Respondents shall provide the Agencies with a Start of Construction Notice in accordance with the schedule contained in Section V (Schedule of Major Deliverables and Other Tasks) of this SOW.

3. Remedial Action Construction

Respondents shall implement the Remedial Action as detailed in the approved RD/RA Work Plan (as updated) and approved Final Design.

4. Prefinal Construction Inspection

A Prefinal Construction Inspection shall be scheduled in accordance with the schedule contained in Section V (Schedule of Major Deliverables and Other Tasks) of this SOW after Respondents determine that construction is complete and the Remedial Action, or a discrete portion of the Remedial Action, is operational and functional meeting the Performance Standards of Section III (Performance Standards) of this SOW. Respondents shall notify the Agencies so that a prefinal inspection can be conducted and attended by the Agencies, Respondents, and other participants including the Project Coordinators and other federal, state, and local regulatory Agencies with a jurisdictional

interest. If a Prefinal Construction Inspection is held for a portion of the Remedial Action, one or more additional inspections shall be conducted so that the entire Remedial Action shall have been inspected.

The objective of the inspection/s is to determine whether construction is complete and the Remedial Action (or the inspected portion) is operational and functional. Any outstanding construction items discovered during the inspection shall be identified and noted on a bullet list. Respondents shall certify that the equipment is effectively meeting the purpose and intent of the specifications. Retesting shall be completed where deficiencies are revealed. A Prefinal Construction Inspection Report shall be submitted by Respondents which outlines the outstanding construction items, actions required to resolve the items, completion date for the items, and an anticipated date for a Final Inspection. The Prefinal Inspection Report can be in the form of a bullet list or letter.

5. Final Construction Inspection

If required by the EPA, a Final Construction Inspection shall be conducted after completion of any work identified in the prefinal inspection report in accordance with the schedule contained in Section V (Schedule of Major Deliverables and Other Tasks) of this SOW. Respondents shall notify the Agencies and coordinate the schedule for any final inspection. The final inspection shall consist of a walk-through inspection by the Agencies and Respondents. The prefinal inspection report shall be used as a checklist, with the final inspection focusing on the outstanding construction items identified in the prefinal inspection. Confirmation shall be made that outstanding items have been resolved for all items, including any items which may have been found after the checklist has been developed.

Any outstanding construction items discovered by Respondents or the Agencies during the inspection, whether or not identified on the prefinal inspection, to still require correction shall be identified and noted on a punch list. If any items are still unresolved, the inspection shall be considered to be a Prefinal Construction Inspection requiring another Prefinal Construction Inspection Report and subsequent Final Construction Inspection. After all items are resolved, Respondents shall issue a Final Construction Inspection Report in accordance with the schedule contained in Section V (Schedule of Major Deliverables and Other Tasks) of this SOW.

6. Remedial Action Construction Complete Report

As specified in the approved schedule included in Section V (Schedule for Major Deliverables and Other Tasks) of this SOW, after construction is completed on the entire Remedial Action and the systems are operational and functional as intended and Contaminated Groundwater is contained in all layers of the aquifer, Respondents shall submit a Remedial Action Construction Complete Report. In the Report, a registered Professional Engineer and Respondents' Project Coordinator shall state that the construction of the Remedial Action has been completed in accordance with the RD/RA

Work Plan submitted under this SOW. The written Report shall provide a synopsis of the Work defined in this SOW, describe deviations from the RD/RA Work Plan, include reproduceable and PDF electronic file version of as-built drawings signed and stamped by a Professional Engineer, provide actual costs of the Remedial Action, O&M to date, and a summary of the results of operational and performance monitoring completed to date. The Report shall contain the following statement, signed by a responsible corporate official of Respondents or Respondents' Project Coordinator:

"To the best of our knowledge, after thorough investigation, we certify that the information contained in or accompanying this submission is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

7. Remedial Action Report

As specified in the approved schedule included in Section V (Schedule for Major Deliverables and Other Tasks) of this SOW, after Respondents has determined that the Performance Standards of the Remedial Action are being met and all phases of the work including Operation and Maintenance (O&M), Respondents shall submit an Remedial Action Report. In the Report, a registered Professional Engineer and Respondents' Project Coordinator shall certify that the Remedial Action is operating and functioning as intended and that Performance Standards listed in Section III (Performance Standards) of this SOW are being met. The written Report shall provide a summary of the results of operational and performance monitoring completed to date and shall provide documentation to substantiate Respondents' certification in full compliance with Sections IV(K) (Performance Evaluation Reports) and IV(L) (Quarterly Compliance Monitoring Reports) of this SOW. The Remedial Action Report shall contain the following statement, signed by a responsible corporate official of Respondents or Respondents' Project Coordinator:

"To the best of our knowledge, after thorough investigation, we certify that the information contained in or accompanying this submission is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

G. Operation and Maintenance

O&M shall be performed in accordance with the approved O&M Manual.

1. Operation and Maintenance Plan

An Operation and Maintenance (O&M) Plan is not required. O&M-related information shall be provided by Respondents in Section IV(G)(2) (Operations and Maintenance Manual) of this SOW.

2. Operation and Maintenance Manual

Respondents shall submit a draft O&M Manual during the design period, and prefinal/final submission/s shall be submitted for Agencies' review and EPA approval after the final construction inspection to incorporate manufacturer/vendor information and any design modifications implemented during the Remedial Action in accordance with the schedule contained in Section V (Schedule of Major Deliverables and Other Tasks) of this SOW. If the prefinal O&M Manual is approved by the EPA, a final submission will not be required. The O&M Manual shall include all necessary O&M information for the operating personnel, and shall provide for the following:

- a. System description;
- b. Startup and shutdown procedures;
- c. Criteria for determining when the Remedial Action is operational and functional;
- d. Description and schedule of normal operation and maintenance tasks, including equipment and material requirements, anticipated equipment replacement for significant components, availability of spare parts, provisions for remote monitoring and control, operator training and certification requirements, staffing needs, and related requirements;
- e. Indicators of system performance and/or maintenance (e.g., parameters to be monitored to determine timing for replacement of any items consumed during the remediation process);
- f. Any planned variation in groundwater extraction rate, including whether each extraction well is to be operated at constant or variable flow rate, and a description of the magnitude and timing of any expected variation;
- g. Record keeping and reporting requirements, including operating and inspection logs, maintenance records, and periodic reports; and
- h. Description and analysis of potential operating problems (e.g., equipment failure, higher than expected contaminant concentrations), including emergency operating and response activities (noncompliance diversion or shutdown), failure notification procedures and relevant health and safety information.

3. Sampling and Analysis Plan.

In accordance with Section XVI (Quality Assurance, Sampling, and Data Analysis) of the Administrative Order, and Section IV(M)(1) (Sampling and Analysis Plans) of this SOW, Respondents shall prepare an O&M SAP to perform compliance monitoring during O&M. The SAP shall include a QAPP and Field Sampling Plan.

4. Health and Safety Plan

In accordance with Section IV(M)(3) (Health and Safety Plans) of this SOW, Respondents shall prepare an O&M Health and Safety Plan.

5. Contingency Plan

In accordance with Paragraphs 55 (Remedial Design), 57 (Remedial Action), and 73 (Additional Response Actions) of the Administrative Order and Section IV(M)(4) (Contingency Plans) of this SOW, Respondents shall submit an O&M Contingency Plan.

H. Compliance Monitoring Plan

Compliance monitoring activities shall be performed in accordance with the approved Compliance Monitoring Plan to evaluate whether the Performance Standards, as described in Section III (Performance Standards) of this SOW and in the ROD, are met. Compliance with Performance Standards will be measured by the sampling results from the compliance monitoring wells. The Compliance Monitoring Plan shall specify the locations of compliance monitoring wells and any sentinel wells (excluding sentinel wells for uncontaminated water supply wells which are covered in the General Monitoring Plan); sampling methods; and the sampling frequency, which shall be at least quarterly, unless otherwise approved by the EPA. Respondents shall submit the Compliance Monitoring Plan no later than the specified date in Section V (Schedule for Major Deliverables and Other Tasks) of this SOW. Compliance with the Performance Standards of this SOW will be confirmed by results from sampling on a quarterly basis at compliance monitoring wells which have been approved by the EPA, and shall be documented in Quarterly Compliance Monitoring Reports. Within five (5) calendar days of noncompliance with any Performance Standards in this SOW, the Agencies shall be notified. Confirmation samples shall be taken within 5 calendar days of receipt of information indicating noncompliance. The Compliance Monitoring Plan shall address the following requirements:

1. Data Collection Parameters

Respondents shall specify the locations of compliance and sentinel wells. Such wells shall comply with and be adequate to meet the Performance Standards of this SOW. The Compliance Monitoring Plan shall contain sufficient information for the Agencies to assess whether the samples taken from the compliance and sentinel wells demonstrate compliance with the Performance Standards of this SOW including confirmation sampling. Respondents shall specify the sampling methods. Sampling frequency shall be at least quarterly, unless otherwise approved by the EPA.

2. Computer Modeling

Respondents shall perform computer modeling simulations of groundwater flow and contaminant migration to help determine whether the Remedial Action will sufficiently contain the Contaminated Groundwater during all anticipated operating conditions (i.e., demonstrating that simulated particles originating in contaminated areas are captured by the extraction wells). Respondents shall propose and evaluate modifications to the extraction well plan using an appropriate 3-dimensional, time-varying model of groundwater flow. Before any computer model is used in the remedy design or for remedy implementation, the Agencies shall be provided for review and EPA approval a predictive uncertainty analysis of the model. All models used for remedy design and

remedy implementation shall be calibrated, reviewed by the Agencies and approved by the EPA prior to their use. Actual data shall be used to confirm model data for capture.

The latest transmissivity measurements and other relevant model input data shall be used in modeling runs. After the remedy installation, the Compliance Monitoring Plan shall describe changes for recalibration of the existing model or plans to calibrate a new model, or propose a schedule for providing such information. Respondents shall submit to the Agencies for review and EPA approval any changes in critical modeling assumptions, and discuss their affect on recommended extraction rates, well locations and predictive uncertainty analysis.

3. Split Sampling and Data Analysis and Reporting

Split sampling and data analysis and reporting requirements shall meet the requirements specified in Section IV(J) (General Monitoring Plan) of this SOW.

4. Contingency Action

The Compliance Monitoring Plan shall propose contingency plans to be used in the event that additional compliance monitoring activities are required to evaluate compliance with Performance Standards of this SOW. Contingency actions may include increases in monitoring frequency and installation of additional groundwater monitoring wells. If compliance monitoring data indicate noncompliance, Respondents shall submit a Compliance Action Plan for review by the Agencies and EPA's approval within 14 days of receipt of information indicating noncompliance. Actions may include, but not necessarily be limited to, additional compliance monitoring to confirm the finding of noncompliance, operational modifications followed by additional compliance monitoring, or design and construction efforts for additional extraction activities.

I. Obligation to Perform Further Response Actions and Submission of Plans

As outlined in Paragraphs 67 and 68 (Failure to Obtain Performance Standards), and 71 and 72 (Additional Response Action) of the Administrative Order, if EPA determines Performance Standards have not been meet or that further response actions are required to protect human health and the environment, Respondents shall submit a work plan within thirty (30) days after receiving EPA's notice that additional action is required. Respondents shall implement the plan approved by EPA in accordance with the provisions of the Administrative Order.

J. General Monitoring Plan

Monitoring activities for wells other than those covered under the Compliance Monitoring Plan shall be under the General Monitoring Plan and shall include monitoring of existing and any new water supply wells and their associated sentinel wells within OU-3. The Plan shall specify type, locations, frequencies, methods, and duration of monitoring activities. Respondents shall submit the General Monitoring Plan no later than the date specified in Section V (Schedule for

Major Deliverables and Other Tasks) of this SOW. The General Monitoring Plan shall address the following requirements:

1. Data Collection Parameters

A description of the types of data to be collected, sampling and data gathering methods, monitoring locations, sampling frequencies, and, if appropriate, minimum monitoring duration. Existing and any new water supply wells in service within OU-3 shall be sampled at least quarterly for the COC contained in Table III(D)(1)(a) (SWRCP & LWRCP Trigger Levels) in Section IV(Q) (Replacement Water Supply) of this SOW using sampling methods meeting CADHS requirements. Upon confirmation of a detection as specified in Section IV(Q)(1)(a) (Replacement Water Supply) of this SOW of a COC in any amount, the sample frequency shall be changed to monthly unless otherwise approved by the EPA until the well is replaced under Section IV(Q) (Replacement Water Supply) of this SOW. When a water supply well has been replaced, EPA, after review with the State, shall determine the future monitoring requirements for the well if the well is not to be destroyed.

2. Well Discharge

Respondents shall measure flow rates at each extraction well (and/or volumes of water extracted) as a function of time, using a meter/totalizer installed on the discharge pipe for each extraction well. The reading on the meter/totalizer shall be recorded at least quarterly and whenever water quality samples are collected from that well.

3. Treatment Facilities Effluent/Treated Groundwater

Respondents shall propose appropriate parameters and schedules for sampling of treated groundwater to ensure compliance with the regulatory requirements applicable to the effluents based upon the intended use of the effluents. Surface water discharge shall meet the requirements of Attachment 3 (Surface Water Discharge Limitations) of this SOW or the latest revision to an NPDES permit applicable to the discharge. Discharge to a water purveyor shall meet the requirements of CADHS. Respondents shall analyze treated water samples to verify attainment of groundwater treatment levels and monitor operational parameters that are used as indicators of treatment facilities performance or the need for maintenance. After a period of initial monitoring, Respondents may propose criteria for subsequent reductions in sampling and/or analysis frequencies if the sampling results support such reductions for review by the Agencies and EPA's approval.

4. Contaminant Mass Removal

Respondents shall calculate the mass of individual contaminants removed from the aquifer by each extraction well in each quarter as well as providing the cumulative total mass of contaminants removed by OU-3 to date.

5. Aquifer Testing

Respondents shall perform aquifer tests at new extraction wells to estimate aquifer transmissivity in the vicinity of the wells.

6. Air Emissions Monitoring

Respondents shall perform air emission monitoring to verify that air emissions from treatment operations do not exceed ARARs.

7. Data Analysis and Reporting

The General Monitoring Plan shall also describe how the performance data will be analyzed, interpreted, and reported to evaluate compliance with ARARs. All data shall be submitted by the deadlines specified in this Section. Claims of change, difference, or trend in water quality or other parameters (e.g., between observed values and an ARAR) shall include the use of appropriate statistical concepts and tests. The General Monitoring Plan shall provide a brief description of reporting requirements for data collection contained in Section IV(L) (Quarterly Compliance Monitoring Reports) and Section IV(K) (Performance Evaluation Reports) of this SOW.

All analytical data shall be available to the Agencies within 60 calendar days of shipment of a sample to the laboratory or 14 days of receipt of analytical results from the laboratory, whichever occurs first. Validated data in an approved electronic format and structure shall be submitted to the Agencies within 90 calendar days of the shipment to the laboratory. Well construction information shall be submitted at the completion of the initial sampling activities or within 90 days after completion of a well, whichever is earlier. NPDES monitoring shall be submitted in accordance with the permit requirements.

8. Split Sampling

The General Monitoring Plan shall also specify procedures for coordination of Agencies' collection of split or replicate samples.

K. Performance Evaluation Reports

Performance Evaluation Reports shall be provided in accordance with the schedule contained in Section V (Schedule for Major Deliverables and Other Tasks) of this SOW. Each report shall include summaries of compliance monitoring activities from the previous reporting period including summaries from Section IV(L) (Quarterly Compliance Monitoring Reports) of this SOW; updated water level contour maps showing measured water levels; field data to demonstrate hydraulic containment; water level contours; measured contaminant concentrations with contour maps; the interpreted extent of contamination; and appropriate groundwater modeling results required to demonstrate compliance with this SOW, including a detailed description and explanation of improvements made to the computer model of

groundwater flow and contaminant migration in the preceding year and the resulting calibration; summaries of relevant operating and field data, including mass removal; any preliminary calculations and supporting data used to evaluate compliance; descriptions of the nature of, duration of, and response to any noncompliance; and any other requirements outlined in the Section IV(J) (General Monitoring Plan) and Section IV(K) (Performance Monitoring Plan) of this SOW.

Initially, at a minimum, individual contaminant contour maps shall be prepared indicating the concentrations and extent of perchlorate, NDMA and TCE contamination in each layer of the aquifer. Contour maps shall also indicate mass removal. Additional contour maps shall be prepared if requested by the Agencies to indicate the extent of migration and concentration levels of any or all of the other thirteen (13) COC. Assumptions made in averaging, excluding, truncating, or otherwise selecting or manipulating the data to be used in preparing the contour maps shall be clearly stated.

L. Quarterly Compliance Monitoring Reports

The Quarterly Compliance Monitoring Reports shall include: measured contaminant concentrations at compliance monitoring wells; charts showing contaminant concentrations versus time at compliance monitoring wells; assessments and statements regarding whether Performance Standards of this SOW are not being satisfied at compliance monitoring wells; predictions, if appropriate, of possible future occurrences of noncompliance; relevant preliminary calculations and supporting data used to evaluate compliance; and any other relevant requirements outlined in the Compliance Monitoring Plan.

The Quarterly Compliance Monitoring Reports shall be in accordance with the scheduled contained in Section V (Schedule for Major Deliverables and Other Tasks) of this SOW. The report shall be based on data obtained using the O&M SAP for OU-3. The fourth quarter report shall provide a yearly summary with trends for groundwater remediation progress and provide recommendations for system modifications/adjustments. The Quarterly Compliance Monitoring Reports shall analyze for all the COC contained in Attachment 1 (Contaminants of Concern and Cleanup Levels) of this SOW, unless the EPA directs the addition or deletion of COC. The Quarterly Compliance Monitoring Reports are to include plots, in each layer of the aquifer, for perchlorate, NDMA, TCE and any other COC requested by the EPA. At a minimum, contaminate plots shall show at least four concentration contours for each contaminant agreed to by the EPA, one of which will be the cleanup level set forth in Attachment 1 (Contaminants of Concern and Cleanup Levels) of this SOW.

M. Supporting Plans

1. Sampling and Analysis Plans (SAPs)

In accordance with Section XVI (Quality Assurance, Sampling, and Data Analysis) of the Administrative Order, Respondents shall prepare SAPs for 1) remedial design sampling, 2)

remedial construction sampling, and 3) the O&M sampling for review by the Agencies and EPA's approval.

The Remedial Design SAP shall be designed to fill in data gaps (information not obtained during the Remedial Investigation) such that Respondents can 1) proceed with the design of the groundwater extraction well system with appropriate lateral spacing in order to establish the necessary hydraulic containment of the Contaminated Groundwater; and 2) design the treatment facilities to handle the mass loading of the COC for OU-3.

The Construction SAP shall be designed to conduct the necessary tests and inspections to ensure that remedy components meet the design specifications such as testing of mechanical components and systems during the initial operation of the remedy components, and testing whether the extraction wells and pumps deliver the expected designed flow rates.

The Long-Term O&M SAP shall be designed to collect sufficient data to monitor the effectiveness of the groundwater remedy. Sampling frequencies shall be sufficient to capture varying chemical concentrations in the aquifer and establish cleanup trends. The data gathered will be used to make the determination if the designed system is having the desired impact on the groundwater aquifer and whether cleanup will proceed according to schedule.

Respondents shall carry out any other field investigations needed to complete the Remedial Design and to construct and operate the Remedial Action. The Plans shall discuss the timing of data collection activities, including data collection activities needed to establish baseline conditions before startup of the Remedial Action. A decision tree shall be provided for evaluating the need for more frequent sampling or for installing additional sentinel or compliance monitoring wells. The Respondents shall use the best available practical quantitation limit from commercial laboratory methods for sampling COC unless otherwise approved in writing by the EPA. The Plans shall also have the provision for reporting trace data for COC for informational purposes to be recorded as "J" data in the data base when requested by the EPA.

The SAPs shall be submitted for review by the Agencies and EPA's approval in accordance with the schedule contained in Section V (Schedule of Major Deliverables and Other Tasks) contained in this SOW. Each SAP shall include a Field Sampling Plan (FSP), a QAPP, and a schedule for implementation of sampling, analysis, and reporting activities. Each FSP and QAPP may be submitted as one document or separately, and may reference an existing FSP or QAPP (as long as existing documents are updated to address the scope of the addition of OU-3 requirements and meet current EPA guidance). Respondents shall not proceed to implement the sampling activities described in the SAP unless the SAP has been approved by the EPA.

- a. Each FSP shall describe sampling objectives, analytical parameters, sample locations and frequencies, sampling equipment and procedures, sample handling and analysis, management of investigation-derived wastes, and planned uses of the data. Each FSP shall be consistent with the latest revision of "EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations" (EPA QA/R-5, November 1999),

“Guidance for Quality Assurance Project Plans” (EPA QA/G-5, February 1998), “Guidance for the Data Quality Objectives Process” (EPA QA/G-4, August 2000), “Preparation of a USEPA Region 9 Field Sampling Plan for Private and State-Lead Superfund Projects” April 1990, EPA (No. 9QA-06-89) and other applicable guidance. Each FSP shall be written so that a field sampling team unfamiliar with the project would be able to gather the samples and field information required. Each FSP shall include a schedule that describes activities that must be completed in advance of sampling, including acquisition of property, access agreements, and arrangements for disposal of investigation-derived waste.

- b. Each QAPP shall describe Performance Standards of this SOW being measured, organizational and functional activities, data quality objectives (DQOs), and quality assurance and quality control (QA/QC) protocols that shall be used to achieve the desired DQOs. Each QAPP shall be consistent with “EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations” (EPA QA/R-5, November 1999), “Guidance for the Data Quality Objectives Process” (EPA QA/G-4, August 2000) and other applicable guidance (see list of references). The DQOs shall, at a minimum, reflect use of analytical methods for obtaining data of sufficient quality to meet National Contingency Plan requirements as identified at 40 C.F.R. Section 300.435(b).

Each QAPP shall address personnel qualifications, sampling procedures, sample custody, analytical procedures, document control procedures, and preservation of records in accordance with Section XVI (Quality Assurance, Sampling, and Data Analysis) of the Administrative Order. In addition, each QAPP shall address data reduction, data validation, data management, procedures that will be used to enter, store, correct, manipulate, and analyze data, protocols for transferring data to the Agencies in electronic format, and document management.

All analytical data shall be available to the Agencies within 60 calendar days of shipment of a sample to the laboratory or 14 days of receipt of analytical results from the laboratory, whichever occurs first. Validated data in an approved electronic format and structure shall be submitted to the Agencies within 90 calendar days of the shipment to the laboratory. Well construction information shall be submitted at the completion of the initial sampling activities or within 90 days after completion of a well, whichever is earlier. NPDES monitoring shall be submitted in accordance with the permit requirements.

Respondents shall demonstrate in advance and to the EPA’s satisfaction that each laboratory it may use is qualified to conduct the proposed Work and meets the requirements specified in Section XVI (Quality Assurance, Sampling, and Data Analysis) of the Administrative Order. The EPA may require that Respondents submit detailed information to demonstrate that the laboratory is qualified to conduct the Work, including information on personnel qualifications, equipment and material specification, and laboratory analyses of performance samples (blank and/or spike samples). In

addition, the EPA may require submittal for its review of data packages equivalent to those generated by the EPA Contract Laboratory Program (CLP) and data tapes.

2. Construction Quality Assurance Plan

The Construction Quality Assurance Plan to be developed and implemented by Respondents shall ensure, with a reasonable degree of certainty, that the completed Remedial Action construction meets or exceeds all design criteria, plans and specifications, and Performance Standards of this SOW. The Construction Quality Assurance Plan shall be submitted to the Agencies for review and EPA's approval and shall include the following elements:

- a. Responsibilities and authorities of all organizations and key personnel involved in the design and construction of the Remedial Action;
- b. A description of the quality control organization, including a chart showing lines of authority, members of the Quality Assurance team, their responsibilities and qualifications, and acknowledgment that the Quality Assurance team will implement the quality control system for all aspects of the Work specified and shall report to Respondents' Project Coordinator and the Agencies. Members of the Quality Assurance team shall have a good professional and ethical reputation, previous experience in the type of QA/QC activities to be implemented, and demonstrated capability to perform the required activities. They shall also be free from the guidance, influence, and control of the construction contractor;
- c. Description of the observations, inspections, and control testing that will be used to assure quality workmanship, verify compliance with the plans and specifications, or meet other QC objectives during implementation of the Remedial Action. This includes identification of sample size, sample locations, and sample collection or testing frequency, and acceptance and rejection criteria. The Plan shall specify laboratories to be used, and include information which certifies that personnel and laboratories performing the tests are qualified and the equipment and procedures to be used comply with applicable standards;
- d. Reporting procedures, frequency, and format for QA/QC activities. This shall include such items as daily summary reports, inspection data sheets, problem identification and corrective measures reports, design acceptance reports, and final documentation. Provisions for the final storage of all records shall be presented in the Construction Quality Assurance Plan. The QA official shall report simultaneously to Respondents' representative and to the Agencies; and
- e. A list of definable features of the Work to be performed. A definable feature of Work is a task which is separate and distinct from other tasks and has separate quality control requirements.

3. Health and Safety Plans (HSPs)

Respondents shall prepare and implement HSPs to cover the following: 1) remedy design and associated design phase field activity, 2) remedy construction and associated field activities, and 3) field activities after remedy construction during the O&M period to ensure protection of on-site personnel and area residents from hazards posed by the Remedial Action. The Plans shall conform with the latest revision of the U.S. Occupational, Safety, and Health Administration (OSHA) requirements as outlined in 29 C.F.R. §§ 1910 and 1926, and any other applicable protocols and applicable requirements. The HSPs shall describe health and safety risks, employee training, monitoring and personnel protective equipment, medical monitoring, levels of protection, safe work practices and safeguards, contingency and emergency planning, individuals responsible in an emergency, and provisions for Site control for workers and for visitors to the job site. The Agencies will review Respondents' Health and Safety Plans but the EPA will neither approve nor disapprove the documents.

4. Contingency Plans

In accordance with Paragraphs 55 (Remedial Design) and 57 (Remedial Action) of the Administrative Order, Respondents shall submit a Construction Contingency Plan and an O&M Contingency Plan for actions to be taken in the event any action or occurrence during the performance of the Work causes a release or threatens to cause a release of hazardous substances or waste material from the Site creating an emergency situation that may present an immediate threat to public health or welfare or the environment. The Construction Contingency Plan and O&M Contingency Plan shall be submitted for review by the Agencies and EPA's approval. The O&M Contingency Plan shall specifically address actions to be taken if any portion of the remedy malfunctions or fails causing a threat of release or release of COC or Waste Materials from the Site that constitutes an emergency situation or presents an immediate threat to public health or welfare or the environment.

N. Certification of All Work Complete Report

As specified in Paragraph 65 (Remedial Design) in the Administrative Order and the schedule included in Section V (Schedule for Major Deliverables and Other Tasks) of this SOW, Respondents shall conduct a Pre-Certification Inspection for Completion of the Work followed by a Certification of All Work Complete Report after all phases of the Work (including O&M) under the Administrative Order have been performed for review by the Agencies and EPA's approval. The Pre-Certification Inspection for Completion of the Work shall be attended by Settling Defendant, EPA and the State Agencies. In the Certification of Work Completion Report, a registered Professional Engineer and Respondents' Project Coordinator shall state that the Work has been completed in full satisfaction of requirements of Paragraph 66 (Remedial Action) of the Administrative Order. The written report shall provide a synopsis of the Work defined in this SOW, describe deviations from the RD/RA Work Plan, provide actual costs of the Remedial Action (and O&M), and provide a summary of the results of operational and performance monitoring that have been completed. The report shall contain the following statement, signed by a responsible corporate official of Respondents or Respondent's Project Coordinator:

“To the best of our knowledge, after thorough investigation, we certify that the information contained in or accompanying this submission is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.”

O. *In-Situ* Bioremediation Treatability Evaluation

As part of the RD Work Plan, an *In-Situ* Bioremediation Treatability Study (*in-situ* study) shall be conducted. The *in-situ* study shall be submitted for review by the Agencies and EPA’s approval and provide adequate information to determine if *in-situ* bioremediation can be effectively and economically implemented for OU-3 to expedite remediation of groundwater with perchlorate and Volatile Organic Compounds (VOCs) without adverse impact to the aquifer. The treatability study shall have provision for expansion, when requested by the EPA, to include an *In-situ* Bioremediation Treatment Pilot Report (*in-situ* pilot report) and succeeding *In-situ* Bioremediation Treatment Evaluation Report (*in-situ* evaluation report) to be submitted for review by the Agencies and EPA’s approval. The *in-situ* field pilot shall be designed to obtain the data to determine if *in-situ* bioremediation merits addition to the OU-3 remedy, the estimated cost for implementation, any reduction in remedy duration, and evaluate further the total system reliability and potential cost savings. The *in-situ* field pilot shall also provide a detailed assessment of any potential adverse impacts to the aquifer and document effective achievement of cleanup levels. If the *in-situ* pilot report recommends that *in-situ* bioremediation merits addition to the OU-3 remedy and the EPA concurs, Respondents shall submit an *in-situ* evaluation report. The *in-situ* evaluation report shall provide an Engineering Evaluation and Cost Analysis (EECA) or equivalent document, justification for any elimination of extraction wells and rationale for any projected reduction in remedy duration and cost. The *in-situ* study, *in-situ* pilot study and *in-situ* evaluation report shall be submitted in accordance with the schedule contained in Section V (Schedule for Major Deliverables and Other Tasks) of this SOW.

P. Institutional Controls

Respondents shall duly execute the ICs covered in this SOW for OU-3 and submit them in accordance with the schedule contained in Section V (Schedule of Major Deliverables and Other Tasks) of this SOW. Respondents shall provide the Agencies each year an Annual Institutional Controls Status Report detailing the status of all ICs for OU-3.

1. Respondents shall submit for review by the Agencies and then record after obtaining EPA’s approval a Declaration of Covenants and Environmental Restrictions Related to Groundwater for land to be developed within OU-3 (with the exception of property on IRCTS which has State ICs) with the following restrictions: 1) No extraction of groundwater except if required by the Remedial Acton; 2) No operation of sedimentation control basins designed to infiltrate water unless expressly permitted in writing by the CVRWQCB; 3) No operation of injection wells; 4) No extraction of groundwater that is encountered during excavation or construction for more than 24 hours, unless there is a sustained rain event or an extended period of groundwater extraction is expressly permitted in writing by the CVRWQCB; and 5) Agencies’ right of access.

These restrictions shall be implemented through a recorded Declaration of Covenants and Environmental Restrictions Related to Groundwater pursuant to California Health and Safety Code Section 25260 and California Civil Code Section 1471(c), whereby Respondents covenants to impose these restrictions. These covenants and environmental restrictions will be binding to Respondents' successors and assigns as covenants running with the land. The EPA shall have the right to enforce these restrictions. Respondents shall give written notice of the Contaminated Groundwater to each buyer, lessee, renter and mortgagee of any of these lands and every lease, deed, mortgage or instrument conveying any part of these lands shall expressly provide that it is subject to this Declaration of Covenants and Environmental Restrictions until EPA issues a Certificate of Completion.

2. If treated groundwater discharge will exceed the levels set forth in the latest revision to Table III(D)(1)(a) (SWRCP & LWRCP Trigger Levels) in Section IV(Q) (Replacement Water Supply) of this SOW at the point of entry to a water purveyor's system, Respondents shall provide formal Notification of Action Level Exceedance (NALE) for each occurrence to CADHS, the Agencies and to water suppliers that could receive the water. Notification shall follow the CADHS latest requirements and shall be within 24 hours of Respondents' receipt of initial sample results. Confirmation of exceedance shall be by use of preserved split sample from the original sample or accelerated priority confirmation sampling completed within 72 hours of receipt of exceedance notification by Respondents.
3. Respondents shall provide an annual Public Notification of Extent of OU-3 Contaminated Groundwater in two local newspapers showing the OU-3 area of Contaminated Groundwater, the requirement for a permit for any well within OU-3, and point of contact for a permit. The annual notification shall be consistent with current CADHS policy and Respondents shall obtain CADHS approval of the format. If approved by the EPA, Respondents may provide notification to the local community using an electronic information format acceptable to CADHS.

Q. Replacement Water Supply

As part of the provision for the replacement water supply, Respondents shall develop and submit for review by the Agencies and EPA's approval a short-term water replacement contingency plan (SWRCP), a long-term water replacement contingency plan (LWRCP), and perform chronic toxicity monitoring on treated groundwater if it is to be used for direct potable use in accordance with the schedule contained in Section V (Schedule of Major Deliverables and Other Tasks) of this SOW as follows:

1. Respondents shall implement, and augment as water is used, a SWRCP to provide for replacement water, within 24 hours, of any water supplies (e.g., public or private water supply for potable or non-potable use) lost within OU-3. The SWRCP shall provide for dedicated and dependable source/s of replacement water (e.g., not subject to removal during peak demand needs in the summer) until the LWRCP can provide permanent replacement water. The SWRCP shall also provide for the replacement of any water

supply reductions caused by implementation of the Groundwater Management Zone Plan approved by the EPA. The SWRCP shall include provisions for actions to be undertaken, work schedule and estimated costs for the Work. At a minimum, the SWRCP provisions shall provide for the following:

- a. The interim replacement of any water supply lost due to a groundwater COC in any amount where verified confirmation sampling equals or exceeds the respective trigger levels listed in the latest revision of Table III(D)(1)(a) below in this SOW. The interim replacement shall continue until 1) Confirmation Sampling (consistent with this Subparagraph) verifies that the concentrations in the well are below the trigger levels for perchlorate and NDMA and below two-thirds the MCL for any other COC; or 2) Respondents demonstrates to the Agencies and the EPA agrees in writing that Respondents did not contribute to the contamination in the lost water supply well; or 3) until a permanent water supply replacement has been provided.

Confirmation Sampling shall consist of two samples per week for three weeks following the initial trigger level exceedance. If 50 percent or more of the confirmation samples have concentrations that equal or exceed any specific SWRCP trigger level in the latest revision to Table III(D)(1)(a) in this Section IV(Q), then the trigger level shall be verified as being exceeded. The EPA's assessment that Respondents did not contribute to the contamination of a well is subject to revision if new information becomes available. The SWRCP Trigger Levels set forth in Table III(D)(1)(a) of this Section shall be kept current at two-thirds the most stringent adopted federal or state MCL. In the case of Perchlorate and NDMA, until MCLs are adopted, the latest most stringent California Action Level or concentration calculated from the latest EPA Health Advisory shall be used. A change to Table III(D)(1)(a) shall be applicable for purposes of this SOW upon EPA's written notice to Respondents without the need to modify the Administrative Order.

Table III(D.)(1.) (a) SWRCP & LWRCP Trigger Levels	
Chemical	SWRCP Trigger Level in ppb
Perchlorate	4.0
NDMA	0.0013*
Trichloroethene	3.33
Tetrachloroethene	3.33
1,1-Dichloroethane	3.33
1,2-Dichloroethane	0.33
1,1,2-Trichloroethane	3.33
1,1-Dichloroethene	4.0
1,2-Dichloroethene	4.0
1,1,2-Trichloro-1,2,2-trifluoroethane	800
Chloroform	66.7
Vinyl Chloride	0.33
Carbon Tetrachloride	0.33
Nitrate	6,667
Nitrite	667

* The current Practical Quantitation Level (PQL) level is 5 ppt. Best available monitoring method technology shall be used until a PQL of 1.3 ppt is achieved.

- b. The SWRCP shall provide for at least a two-year replacement capacity for water supplies lost or reductions in a well's operating capacity for Contaminated Groundwater control. The two-year replacement capacity that shall be provided shall be the greater of the following unless otherwise agreed to by the EPA:
 - (1) The sum of the peak capacities of water supplies that are within 1,000 feet of the Contaminated Groundwater plume as delineated in Attachment 2 (Extent of Contamination and Approximate Remediation Well Locations) of this SOW updated by the EPA on the Effective Date of the Administrative Order for OU-3 or a subsequent updated contaminated groundwater plume map submitted as part of the annual revision of the SWRCP pursuant to Section IV(Q)(1)(d) (Replacement Water Supply) of this SOW that has been approved by the EPA;
 - (2) Fifteen percent of the peak capacities of all water supplies within OU-3 as determined by the EPA on the Effective Date of the Administrative Order for OU-3; or
 - (3) The sum of: (a) the peak capacities for water supplies that are predicted to be lost within the next two years based on the data generated by the OU-3 RI/FS computer particle tracking model as updated pursuant to Section IV(Q)(1)(d) (Water Replacement Supply) of this SOW and (b) any anticipated capacity reductions required to comply with the Groundwater Management Zone Plan approved by the EPA.

- c. The SWRCP capacity projection shall include the time needed to bring short- and long-term replacement capacity on-line. The short-term replacement capacity is to be tied into the affected water purveyor's distribution system to allow for reliable and adequate distribution pressure and volume in a manner acceptable to CADHS to allow for permitting of the modification. The water supply and distribution system shall include all needed appurtenance to meet CADHS requirements for volume, pressure, controls and all other items necessary for the permitting of the system. Hydraulic modeling of the distribution system shall be provided to meet CADHS requirements. The SWRCP shall provide for telemetry operation or necessary water wheeling agreements acceptable to the water purveyor/s to receive the water to allow for replacement of the anticipated water supply loss within 24 hours. If the SWRCP employs use of surface water as replacement water, Respondents shall pay for the expansion or construction of new surface water treatment facilities with distribution system/s all of which shall meet CADHS requirements.
- d. The SWRCP shall be revised annually. The revision shall review present peak capacity and shall model projections for all losses over the next two years in order to provide an adequate short-term water supply. The SWRCP revisions shall include an updated plume configuration based on the latest available data. The SWRCP capacity projection shall including the time necessary to make the capacity available for actual use and any well losses known or anticipated for remedy control specified in Section IV(R) (Groundwater Management Zone Plan) of this SOW.

Except within three months of an annual revision of the SWRCP due the Agencies, any time a portion of the capacity is used which exceeds the projected use in the latest SWRCP by twenty percent, the SWRCP shall be updated and submitted for review by the Agencies and EPA's approval.

- 2. Respondents shall develop and implement a LWRCP for the permanent replacement of water supplies (e.g., public or private water supply for potable or non-potable use). The LWRCP shall provide for a dedicated and dependable source of adequate water to permanently replace water supplies lost for the duration of the implementation of the remedy, including supplies lost due to implementation of the Groundwater Management Zone Plan. The initial LWRCP and subsequent revisions shall include, based on a computer model, a minimum five-year planning projection of anticipated replacement demand for all of OU-3. The computer model shall be an adaptation of the SWRCP model. The LWRCP shall apply to water supply wells already in place at the time of the Effective Date of the Administrative Order as determined by the EPA, and to both replacement water supply wells and new water supply wells installed in accordance with the Groundwater Management Zone Plan which become contaminated during implementation of the remedy. The LWRCP shall include actions to be undertaken, a work schedule and estimated costs for the proposed Work. The LWRCP shall provide for the following:

- a. Permanent replacement of any water supplies lost due to a groundwater COC in any amount where verified Confirmation Sampling equals or exceeds the respective trigger levels listed in the latest revision to Table III(D)(1)(a) (SWRCP & LWRCP Trigger Levels) of Section IV(Q) (Replacement Water Supply) of this SOW. Within 18 months of verification of Confirmation Sampling, Respondents shall permanently replace contaminated water supply wells with a dedicated and dependable equivalent water supply meeting CADHS requirements.
- b. The implementation of permanent replacement capacity to meet the LWRCP projections shall be based on a minimum five-year planning period. Respondents must provide with each LWRCP submission supporting documentation, for review by the Agencies and EPA's approval, for any water supply well projected to be lost which Respondents believe they did not contribute a COC in any amount listed in the latest revision to Table III(D)(1)(a) (SWRCP & LWRCP Trigger Levels) of Section IV(Q) (Replacement Water Supply) of this SOW.
- c. The LWRCP replacement capacity is to be tied into the affected water purveyor's distribution system to allow for a reliable and adequate distribution pressure and volume in a manner acceptable to CADHS to allow for permitting of the modification. The water supply and distribution system shall include all needed appurtenance to meet CADHS requirements for volume, pressure, controls and all other items necessary for the permitting of the system. A hydraulically equivalent distribution system shall be provided with computer hydraulic modeling done to meet CADHS requirements. If LWRCP employs use of surface water as replacement water, Respondents shall pay for the expansion or construction of new surface water treatment facilities with distribution systems and necessary appurtenance, all of which shall meet CADHS requirements.
- d. Revision of the LWRCP shall be conducted every five years and submitted for review by the Agencies and EPA's approval. The revision shall review present available capacity with computer model projections for permanent replacement requirements over at least the next five years and shall make recommendations to provide an adequate replacement water supply, detailed by individual wells with projected date for replacement.

Except within six months of the next five-year revision of the LWRCP that is due to the Agencies, any time the actual permanent water supply replacement exceeds a yearly projected use in the latest LWRCP projection by fifteen percent, the LWRCP shall be updated and submitted for review by the Agencies and EPA's approval.

3. Direct potable reuse supplemental monitoring shall be performed by Respondents if Respondents are given approval by CADHS to begin direct discharge of treated groundwater to a water purveyor's system. Respondents' groundwater monitoring

program shall be expanded to perform the following additional reviews, analyses, and toxicity testing monitoring two quarters prior to beginning discharge directly to a water supplier, and then on an annual basis thereafter, unless the EPA adjusts the frequency based on monitoring data:

- a. Review new or changes to analytical methods including Comprehensive Analytical Suites (multi-chemical analytical methods) and detection limits that are available for evaluating the presence of chemicals manufactured or used by Respondents at the Site, including the degradation products. This review shall include identifying chemicals and associated degradation products that were used historically or could be reasonably expected to be of potential concern at the Respondents facilities. The list of chemicals shall contain the chemical name, chemical abstract service number, and where available the latest available test method, Comprehensive Analytical Suite test method, practical detection method (PQL) or method reporting limit (MRL), minimum detection limit (MDL) and latest Federal and State action level. If no Federal or State action level exists, an assessment of risk shall be evaluated by use of class of chemical or other available data submitted for review by the Agencies and EPA's approval.
- b. Submit for review by the Agencies and implement after EPA's approval a comprehensive analysis program to augment the quarterly monitoring program for discharge water samples. The comprehensive analysis shall use readily available lab procedures that will lower method detection limits by a factor of five (5) or more. Peaks of Tentatively Identified Compounds (TICs) in concentrated water/extract samples shall be compared with peaks in a reference water/extract samples run through the same treatment train as Respondents' groundwater. Any TICs in Respondents discharge water samples/extract that are not detected in reference water samples/extract or that are present at 10 times above the reference water samples/extract shall be further evaluated in an effort to positively identify the compound or compounds. If required by the EPA based on monitoring data, Respondents shall submit and implement a Toxicity Identification/Reduction Work Plan that has been reviewed by the Agencies and approved by the EPA.
- c. Perform toxicity testing comparable to requirements under Respondents' NPDES permit for surface water discharge from the American River GET using the latest guidance if no NPDES permit is required for the direct water supply discharge.

Respondents shall submit the additional direct discharge monitoring data for review by the Agencies and EPA's approval as part of the compliance monitoring report program. Respondents shall implement monitoring program changes and/or any additional characterization required by the EPA if: a) a new method is identified, b) there is a new or improved detection capability to achieve a cleanup level not yet attained, c) a measured TIC has been identified as a concern by the Agencies, or d) there is any toxicity indicated by bioassay results. Respondents shall make every effort to identify any TICs by chemical abstract service number for TICs that have been noted from the comparison to the reference samples.

R. Groundwater Management Zone Plan

Respondents shall create a Groundwater Management Zone Plan (GMZP) within OU-3 to minimize adverse effect on groundwater levels and prevent interference with the remedy. The GMZP shall be submitted for review by the Agencies and EPA's approval in accordance with the schedule contained in Section V (Schedule of Major Deliverables and Other Tasks) contained of this SOW. The GMZP shall model and assess in each affected aquifer layer any operational restrictions which may be required on existing water supply wells to prevent any adverse effect on the sphere of influence of the remedy extraction wells and to minimize adverse effects to groundwater levels. The GMZP shall also establish the areas (by aquifer layer) where new wells shall not be installed to prevent adverse effect on the remedy. The GMZP shall be developed as part of the RD/RA Work Plan and implemented as part of the Work Plan. Respondents shall coordinate with water purveyors and local regulatory Agencies to develop an assessment of total use impact on the aquifer when generating the GMZP.

S. Off-Site Rule Disposal Notification

In accordance with Paragraph 64 (Remedial Action) of the Administrative Order, six months prior to disposal of wastes generated by Respondents' CERCLA activities to any off-site facility for disposal, Respondents shall provide the EPA and the receiving state, in accordance with federal and state law and California Title 27, disposal notification containing the following: 1) the name of the Site/facility to receive the waste with address and phone number, 2) quantity and description of the waste, 3) RCRA classification of the waste with basis for the classification, 4) expected date for shipment off-site, 5) the regulatory status of the receiving site (i.e., Subtitle C or D permitted), 6) method of transportation, 7) confirmation that the site is approved under the Off-site Rule, and 8) the date of last EPA inspection.

T. Remedy Review

As required by Section XI (EPA Periodic Review) of the Administrative Order, over the remedy period Respondents shall support the EPA in performing technical and documentation support for periodic remedy reviews in accordance with "Comprehensive Five-Year Review Guidance," EPA OSWER 9355.7-03B-P (June 2001 or latest revision). Respondents shall perform any necessary studies and investigations required by the EPA to assess remedy protectiveness. The remedy will be reviewed at least every five years or earlier if deemed appropriate by the EPA.

V. Schedule for Major Deliverables and Other Tasks

ACTIVITY¹	DUE DATE (Unless Otherwise Approved by the EPA)
Administrative Order Effective Date	-
<u>PLANNING DOCUMENTS/COORDINATION</u>	
Notice of Intent to Comply	Five (5) days after Effective Date of Administrative Order
Notification of Project Mgr./qualifications	<p>Ten (10) days after Effective Date of Administrative Order</p> <p>If disapproved by EPA, within thirty (30) days submit list candidates/qualifications</p> <p>Twenty-one (21) days notify EPA Project Mgr. selected from EPA approved candidates on list</p>
Compliance and Sentinel Well Network Plan	<p>Thirty (30) days after Effective Date of Administrative Order</p> <p>(Agencies' review time of fourteen (14) days) ²</p> <p>If required, a revised plan is due fourteen (14) days after receipt of EPA's comments</p>
Notice of Start of Compliance and Sentinel Well Installation	Forty-five (45) days after EPA's approval of Compliance and Sentinel Well Network Plan
Compliance Monitoring Plan	<p>Sixty (60) days after EPA's approval of Compliance and Sentinel Well Installation Complete Report</p> <p>(Agencies' review time of twenty-one (21) days)²</p> <p>If required, a revised plan is due fourteen (14) days after receipt of EPA's comments</p>
RD/RA Work Plan	<p>Thirty (30) days after Effective Date of Administrative Order</p> <p>(Agencies' review time of thirty (30) days)²</p> <p>If required, a revised plan is due fourteen (14) days after receipt of EPA's comments</p>

ACTIVITY¹	DUE DATE (Unless Otherwise Approved by the EPA)
Monthly Progress Report/s required by Section XV of the Administrative Order and IV(D)(1) of this SOW	Fifteen (15) day after each month following Effective Date of Administrative Order until EPA notification of Certification of Completion
General Monitoring Plan	Thirty (30) days after receipt of EPA's comments on RD/RA Work Plan (Agencies' review time of fourteen (14) days) ²
Short-Term Water Replacement Contingency Plan	Ninety (90) days after Effective Date of Administrative Order (Agencies' review time of fourteen (14) days) ² If required, a revised plan is due fourteen (14) days after receipt of EPA's comments
Long-Term Water Replacement Contingency Plan	One-hundred-eighty (180) days after Effective Date of Administrative Order (Agencies' review time of fourteen (14) days) ² If required, a revised plan is due fourteen (14) days after receipt of EPA's comments
Groundwater Management Zone Plan	One-hundred-eighty (180) days after Effective Date of Administrative Order (Agencies' review time of fourteen (14) days) ² If required, a revised plan is due fourteen (14) days after receipt of EPA's comments
Annual IC Status Report	By end of January each year until ICs are completed
Failure to Attain Performance Standards Work Plan required by Paragraph 68 of the Order	Thirty (30) days after notification letter by EPA

ACTIVITY¹	DUE DATE (Unless Otherwise Approved by the EPA)
Additional Response Actions Work Plan required by Section XII of the Order and Section IV(I) of this SOW	Thirty (30) days after notification letter by EPA
Coordination Meeting Summary Minutes	Draft to Agencies fourteen (14) days after meeting (meeting frequency as determined by Agencies) and final seven (7) days after any EPA comments
<u>REMEDIAL DESIGN</u>	
Notification of Supervising Contractor Selection for EPA review and Quality Management Plan submission	Ten (10) days after Effective Date of Administrative Order (Agencies' review time of fourteen (14) days) ² If required, a revised contractor list is due thirty (30) days after receipt of EPA's comments
RD/RA Work Plan	Update, as required
Conceptual/ Preliminary Remedial Design Submittal with Design Basis Report and Construction Contingency Plan	Within Ninety (30) days after EPA's approval of RD/RA Work Plan if a phased approach to the remedy is used otherwise within one-hundred-eighty (180) days (Agencies' review time of thirty (30) days) ² If required, a revised plan is due fourteen (14) days after receipt of EPA's comments
Prefinal/Final Remedial Design Submittal	Ninety (90) days after EPA's approval of Conceptual/Preliminary Design Submittal (Agencies' review time of thirty (30) days) ²
Final Design Submittal (if needed)	If required by EPA, thirty (30) days after EPA's comments on the Prefinal Design Submittal (Agencies' review time of thirty (30) days) ²

ACTIVITY¹	DUE DATE (Unless Otherwise Approved by the EPA)
<i>In-Situ</i> Bioremediation Treatment Study	<p>Three-hundred-sixty (360) days after Effective Date of Administrative Order</p> <p>(Agencies' review time of thirty (30) days)²</p> <p>If required, a revised plan is due fourteen (14) days after receipt of EPA's comments on the last Respondents' submission</p>
<i>In-Situ</i> Bioremediation Treatment Pilot Report	<p>If required by the EPA, the <i>In-Situ</i> Pilot Report shall be submitted three-hundred-sixty (360) days after EPA's notice to proceed unless otherwise agreed to by the EPA</p> <p>(Agencies' review time of thirty (30) days)²</p> <p>If required, a revised report is due fourteen (14) days after receipt of EPA's comments</p>
<i>In-Situ</i> Bioremediation Evaluation Report with EECA	<p>If required by the EPA, the <i>In-Situ</i> Evaluation Report shall be submitted within ninety (90) days of EPA's notice to proceed following completion of the <i>In-Situ</i> Pilot Report</p> <p>(Agencies' review time of thirty (30) days)²</p> <p>If required, a revised report is due fourteen (14) days after receipt of EPA's comments</p>
<u>REMEDIAL ACTION</u>	
List of RA Contractors/ Title/Qualifications	Ten (10) days after EPA approves Conceptual/Preliminary Remedial Design
Notification of Contractor Selection	Twenty-one (21) days after EPA designates approved contractors from Respondents contractor list
Pre-Construction Meeting	Fourteen (14) days after EPA's approval of Final Design or each separate Phased Design Completion
Pre-Construction Meeting Report	Fourteen (14) days after Pre-Construction Meeting or meetings if Phased Approach
Start of Construction Notice	Seven (7) days after construction start or starts if Phased Approach
Contractor Solicitation Documents	Five (5) days after publishing solicitation documents

ACTIVITY¹	DUE DATE (Unless Otherwise Approved by the EPA)
Prefinal Construction Inspection	Fourteen (14) days after Remedial Action satisfies operational and functional criteria
Prefinal Construction Inspection Report	Seven (7) days after Prefinal Construction Inspection
Off-Property Contaminated Groundwater containment component operational and functional notice	Seven (7) after completion date specified in the RD/RA Work Plan
On-Property Contaminated Groundwater containment component operational and functional notice	Seven (7) after completion date specified in the RD/RA Work Plan
Expedited Remediation component operational and functional notice	Seven (7) after completion date specified in the RD/RA Work Plan
Final Construction Inspection (if required)	Twenty-one (21) days after Prefinal Construction Inspection
Final Construction Inspection Report (if required)	Seven (7) days after Final Inspection
Remedial Action Construction Complete Report (with certification)	<p>Draft due sixty (60) days after final construction inspection</p> <p>(Agencies' review time of thirty (30) days)²</p> <p>If required, a revised Report is due thirty (30) days after receipt of EPA's comments</p>

ACTIVITY ¹	DUE DATE (Unless Otherwise Approved by the EPA)
Remedial Action Report	<p>Due two-hundred-seventy (270) days after EPA's approval of the Remedial Action Construction Report or fourteen (14) days after Respondents determine that Performance Standards for the Remedial Action are being met, whichever is earlier.</p> <p>(Agencies' review time of thirty (30) days)²</p> <p>If required, revised report due thirty (30) days after receipt of EPA's comments</p>
Compliance Action Plan	<p>Within fourteen (14) days of receipt of compliance monitoring data indicating noncompliance</p> <p>(Agencies' review time of fourteen (14) days)²</p> <p>If required, a revised report is due fourteen (14) days after receipt of EPA's comments</p>
<u>OPERATION AND MAINTENANCE</u>	
Operation and Maintenance (O&M) Plan	Not required by this SOW
O&M Manual	<p>Draft manual ninety (90) days after EPA's approval of Conceptual/Preliminary Design Submittal and prefinal/final manual thirty (30) days after final construction inspection</p> <p>If required by EPA, the final manual revision is due twenty-one (21) days after receipt of EPA's comments</p>
O&M Contingency Plan as required by Section IV(G) of this SOW	Draft plan ninety (90) days after EPA's approval of Conceptual/Preliminary Design Submittal and final plan thirty (30) days after final construction inspection
Off-Site Rule Disposal Notification	One-hundred-eighty (180) days prior to any off-site disposal other than a POTW

ACTIVITY¹	DUE DATE (Unless Otherwise Approved by the EPA)
<u>PERFORMANCE EVALUATION</u>	
Performance Evaluation Reports	Due every six (6) months after Remedial Action satisfies operational and functional criteria for first four years, and annually thereafter.
Quarterly Compliance Monitoring Reports	Due Quarterly, beginning ninety (90) days after EPA's approval of Compliance Monitoring Plan
Compliance and Sentinel Well Installation Complete Report	Ninety (90) days after completion of compliance and sentinel installation activities (Agencies' review time of fourteen (14) days) ² If required, revised plan due fourteen (14) days after receipt of EPA's comments
Direct Potable Reuse Supplemental Monitoring	Two quarters prior to direct water supply discharge and then annually unless modified by the EPA
Toxicity Identification/Reduction Work Plan	Thirty (30) days after receipt of written request by the Agencies (Agencies' review time of fourteen (14) days) ² If required, revised plan due fourteen (14) days after receipt of EPA's comments
NPDES Permit (Any Off-Aerojet Property Surface Discharge)	Application to CVRWQCB one-hundred-eighty (180) days prior to start of discharge
NPDES Monitoring and Reports	As specified in the National Pollution Discharge Elimination System Permit
Periodic Review (Remedy Protective)	At least every five (5) yrs. unless required earlier by the EPA, after submission of the remedy Remedial Action Report per Section 121(c) of CERCLA
<u>INSTITUTIONAL CONTROLS</u>	
Record Copies of Order	Within five (5) days of the Effective Date of Administrative Order record copies of Order in appropriate Government office where land ownership is recorded for indexing to property title.

ACTIVITY¹	DUE DATE (Unless Otherwise Approved by the EPA)
Notice of Recording and Indexing	Within fifteen (15) of the Effective Date of Administrative Order send Notice of Recording and Indexing to EPA.
Copy of Property Transfer	Sixty (60) days prior to transfer of any real property copy EPA on property transfer notice.
Record Declaration of Covenants and Environmental Restrictions	Record with Official Records of Sacramento County, State of California within ten (10) days of EPA's approval.
Written Notice of Declaration of Covenants and Environmental Restrictions Related to Groundwater (Notice to Successor-in-Title)	At least thirty (30) days prior to conveyance provide to each buyer, lessee, renter and mortgagee of any of these lands and in every lease, deed, mortgage or instrument conveying any of these lands
Notification of Action Level Exceedance	Within twenty-four (24) hours of Respondents' receipt of initial sample results with exceedance
Public Notification of OU-3 Extent of Contaminated Groundwater	Ninety (90) days after Effective Date of Administrative Order then annually until remedy completion in format approved by CADHS.
<u>SUPPORTING PLANS</u>	
Remedial Design Health and Safety Plan; Sampling and Analysis Plan with Quality Assurance Program Plan and Field Sampling Plan	RD HSP within 30 days of selection of an approved Project Mgr. with remaining documents submit within one-hundred-fifty (150) days of selection of an approved Project Mgr.

ACTIVITY¹	DUE DATE (Unless Otherwise Approved by the EPA)
Construction Health and Safety Plan; Sampling and Analysis Plan with Quality Assurance Program Plan and Field Sampling Plan; and Construction Quality Assurance Plan	Submit as a part of the Final Design
O&M Health and Safety Plan; Sampling and Analysis Plan with Quality Assurance Program Plan and Field Sampling Plan	Submit as a part of the Final Design
<u>CERTIFICATIONS REQUIRED BY SECTIONS IX AND XXIII OF ADMINISTRATIVE ORDER</u>	
Pre-Certification Inspection for Completion of the Work	Thirty (30) days after Respondents conclude that all Work has been performed, including completion of all Operation and Maintenance activities
Certification of All Work Complete Report	Thirty (30) days after the Pre-Certification Inspection
<u>FINANCIAL SECURITY REQUIRED BY SECTION XXIII OF ADMINISTRATIVE ORDER</u>	
Financial Security	Thirty (30) days after Effective Date of Administrative Order
<u>CERTIFICATES</u>	
General Liability Ins.	Fifteen (15) days before commencing work then annually until Certification of Completion
Automobile Liability Insurance	Fifteen (15) days before commencing work then annually until Certification of Completion

1. Estimated time, in calendar days.

2. Failure to review a deliverable within the estimated time shall not constitute a violation of the Administrative Order by the United States, DTSC or CVRWQCB.

VI. References

The following list, although not comprehensive, provides citations for many of the regulations and guidance documents that apply to the RD/RA process. Respondents shall review these guidance documents (latest addition/revision) and shall use the information provided therein in performing the RD/RA and preparing all deliverables under this SOW.

"National Oil and Hazardous Substances Pollution Contingency Plan, Final Rule," 40 C.F.R. Part 300.

"Superfund Remedial Design/ Remedial Action Handbook," EPA, Office of Emergency and Remedial Response, June 1995 (EPA 540/R-95/059).

"Interim Final Guidance on Oversight of Remedial Designs and Remedial Actions Performed by Potentially Responsible Parties," EPA, Office of Emergency and Remedial Response, February 14, 1990, OSWER Directive No. 9355.5-01.

"EPA NEIC Policies and Procedures Manual" EPA, May 1978, revised May 1986.

"Guidance for the Data Quality Objectives Process" (EPA QA/G-4, Final, August 2000).

"EPA Requirements for Quality Assurance Project Plans" (EPA QA/R-5, Interim Final, November 1999).

"Guidance for Quality Assurance Project Plans" (EPA QA/G-5, Final, February 1998).

"Preparation of a USEPA Region 9 Field Sampling Plan for Private and State-Lead Superfund Projects" April 1990, EPA (No. 9QA-06-89).

"Guidance on Remedial Actions for Contaminated Ground Water at Superfund Sites," EPA, Office of Emergency and Remedial Response (Draft), OSWER Directive No. 9283.1-2.

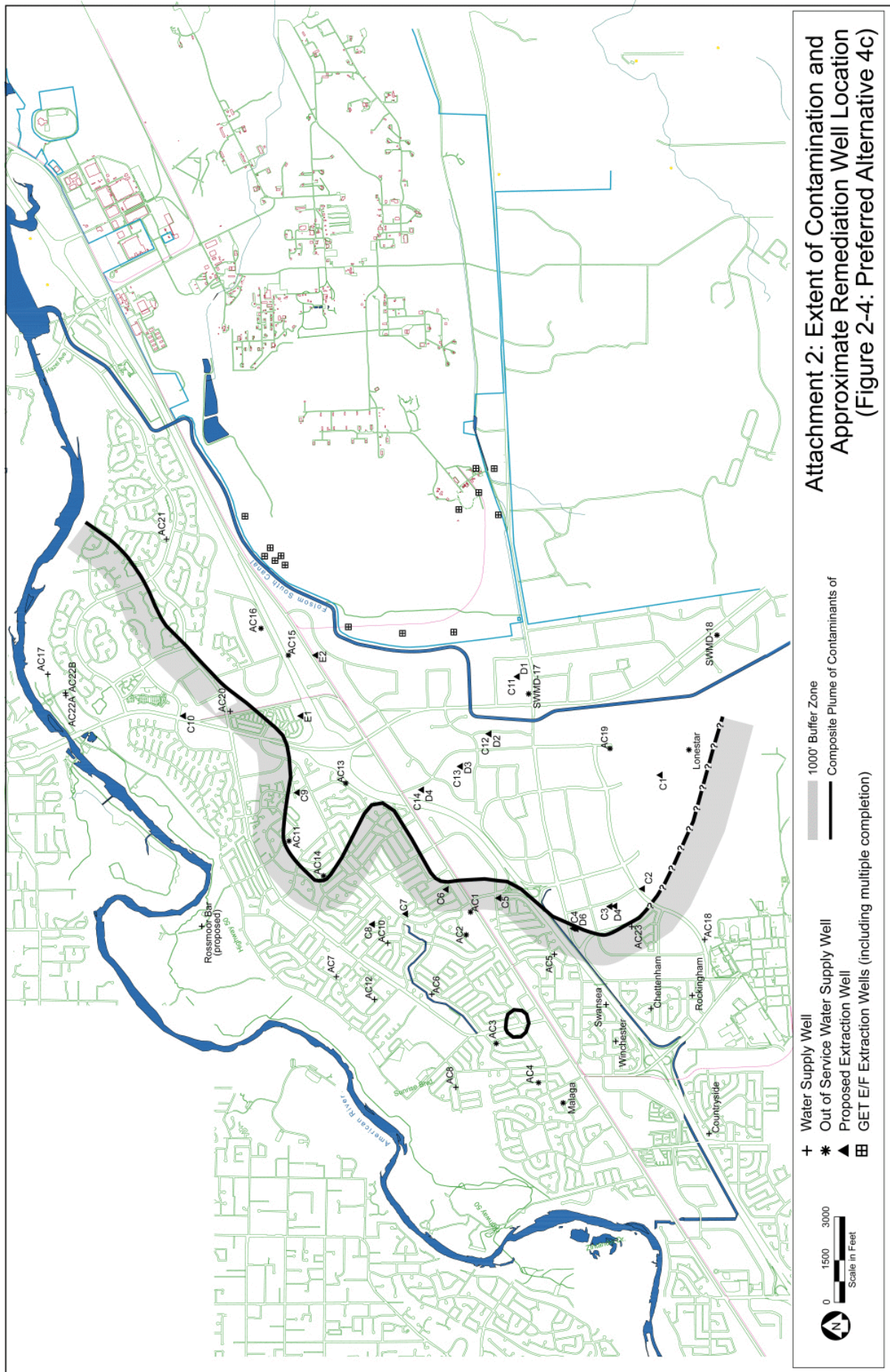
"Methods for Monitoring Pump-and-Treat Performance" EPA, Office of Research and Development, June 1994 (EPA 600/R-94/123).

"Comprehensive Five-Year Review Guidance" (EPA 540-R-01-007, June 2001).

Attachment 1 “Contaminants of Concern (COC) and Cleanup Levels”

Table 2.14 Cleanup Levels for Chemicals of Concern (COC)			
COC	Cleanup Level	Basis for Cleanup Level	Risk at Cleanup Level
Perchlorate	4.0 ppb ¹	Low end of ORD range	Non-carcinogenic risk (NCR) Hazard index (HI) = 1
NDMA	1.3 ppt ²	Preliminary Remediation Goal	Cancer risk 1×10^{-6}
Trichloroethene	5 ppb*	Max. Contaminant Level (MCL) USEPA & CA	Cancer risk 2.4×10^{-6}
Tetrachloroethene	5 ppb*	MCL USEPA & CA	Cancer risk 4.7×10^{-6}
1,1-Dichloroethane	5 ppb*	MCL CA	NCR, HI= 0.009
1,2-Dichloroethane	0.5 ppb*	MCL CA	Cancer risk 2.9×10^{-6}
1,1,2-Trichloroethane	5 ppb*	MCL USEPA & CA	Cancer risk 1.8×10^{-5}
1,1-Dichloroethene	6 ppb*	MCL CA	Cancer risk 1.1×10^{-4}
1,2-Dichloroethene	6 ppb*	MCL CA	NCR, HI = 0.3
1,1,2-Trichloro-1,2,2-trifluoroethane	1200 ppb*	MCL CA	NCR, HI = 0.03
Chloroform	100 ppb*	MCL CA	Cancer risk 4.1×10^{-4}
Vinyl Chloride	0.5 ppb*	MCL CA	Cancer risk 2.2×10^{-5}
Carbon Tetrachloride	0.5 ppb*	MCL CA	Cancer risk 2.3×10^{-6}
Nitrate	10,000 ppb	MCL USEPA	NCR, HI = 0.4
Nitrite	1,000 ppb	MCL USEPA	NCR, HI = 1
<p>Notes: ¹ Low end of Office of Research and Development (ORD) guidance letter of 6/18/99</p> <p>² The NDMA PQL is being improved. The current enforceable level is 5 ppt. Best available monitoring method technology shall be used until a PQL of 1.3 ppt is achieved.</p> <p>* VOCs are expected to be cleaned up to below MCLs as a result of the perchlorate and NDMA treatment.</p>			
<p>The purpose of this Response Action is to control risks posed by water supplies resulting in exposures from ingestion, inhalation and dermal contact. Perchlorate is the most widely distributed chemical and along with NDMA will drive the cleanup of the VOCs. While the cleanup level for VOCs are being set at the MCL level, it is anticipated that achieving the perchlorate and to some extent the NDMA cleanup levels will result in the aquifer cleanup to 10^{-6} cancer risk. The ORD 6/18/99 “Interim Assessment Guidance for Perchlorate” provides the current range of the provisional reference dose value for perchlorate as 0.0001 mg/kg-day to 0.0005 mg/kg-day issued by the National Center for Environmental Assessment (NCEA) in 1995 using standard adult parameters. The perchlorate reference dose and water supply equivalents based on standard parameters are developed from “no observed adverse effects levels” and thus are below the anticipated level that will cause cancer.</p>			

Attachment 2 “Extent of Contamination and Approximate Remediation Well Locations”



Attachment 3 “Surface Water Discharge Limitations”

Table 2.15 - Effluent Limitations & Receiving Water Limitations*		
Effluent Discharge Limitations		
Constituents	Daily Maximum in ug/l	Monthly Average in ug/l
Volatile Organics (1)	Not applicable	0.50
Perchlorate	8	4
1,4 -Dioxane	10	5
N-Nitrosodimethylamine	0.005	0.0013
(1 All volatile organic constituents listed in USEPA Method 8010 and 8020. The concentration of each constituent shall not exceed 0.5 ug/l.		
(2 The discharge shall not have a pH less than 6.5 nor greater than 8.5.		
(3 The 30-day average daily discharge flow shall not exceed 5.04 million gallons per day		
(4 Survival of aquatic organism in 96-hour bioassays of undiluted waste shall be no less than: Minimum for any one bioassay ----- 70% Median for any three or more consecutive bioassays - - - 90%		
Receiving Water Limitations (Discharge shall not cause the following in the receiving water)		
(1 Concentrations of dissolved oxygen to fall below 7.0 mg/l.		
(2 Oils, greases, waxes, or other materials to form a visible film or coating on the water surface or on the stream bottom.		
(3 Oils, greases, waxes, floating material (liquids, solids, foams, and scums) or suspended material to create a nuisance or adversely affect beneficial uses.		
(4 Aesthetically undesirable discoloration.		
(5 Fungi, slimes, or other objectionable growths.		
(6 Turbidity not to increase more than 1 Natural Turbidity Units (NTUs) when natural turbidity is between 0 & 5 NTUs; increase more than 20 % when natural turbidity is between 5 & 50; increase more than 10 NTUs if the natural turbidity is between 50 & 100 NTUs; nor increase more than 10 % when the natural turbidity is greater than 100 NTUs.		
(7 The normal ambient pH to fall below 6.5, exceed 8.5, nor cause the normal ambient pH to change by more than 0.5 pH units.		
(8 Deposition of material that causes nuisance or adversely affects beneficial uses.		
(9 The normal ambient temperature to be increased more than 5°F.		
(10 Taste or odor-producing substances to impart undesirable tastes or odors to fish flesh or other edible products of aquatic origin or to cause nuisance or adversely affect beneficial uses.		
(11 Radionuclides to be present in concentrations that exceed maximum contaminant levels specified in the California Code of Regulations, Title 22; that harm human, plant, animal or aquatic life; or that result in the accumulation of Radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life.		
(12 Aquatic communities and populations, including vertebrate, invertebrate, and plant species, to be degraded.		
(13 Toxic pollutants to be present in the water column, sediments, or biota in concentrations that adversely affect beneficial uses; that produce detrimental response in human, plant, animal, or aquatic life; or that bioaccumulate in aquatic resources at levels which are harmful to human health.		
(14 Violation of any applicable water quality standard for receiving waters adopted by the Board or the State Water Resources Control Board pursuant to the CWA and regulations adopted thereunder.		
* These effluent discharge limitations may need to be supplemented in the NPDES Permit process, depending on the discharge point (Lake Natoma, Folsom South Canal or Buffalo Creek) and the receiving water (American River, Cosumness River and Mokelumne River).		

Attachment 4 “Applicable or Relevant and Appropriate Requirements (ARARs)”

Table 2.16 - Description of ARARS for Selected Remedy					
Authority	Medium	Requirements	Status	Synopsis of Requirements	Action to be Taken to Attain Requirements
Chemical-Specific ARARs					
Federal Regulatory Requirement	Ground-water (GW)	Federal Safe Drinking Water Maximum Contaminant Levels (MCLs)	Relevant & Appropriate (R&A)	MCLs have been regulated for a number of common organic and inorganic contaminants. These levels regulate the concentrations of contaminants in public drinking water supplies and are considered relevant and appropriate for ground-water aquifers potentially used for drinking water.	The selected remedy will comply with these requirements. The cleanup levels for the VOCs in the aquifer are set at MCLs. Where there are no MCLs for the contaminants, e.g., perchlorate and NDMA, the cleanup levels are based on risk.
State Regulatory Requirement	GW	Title 27, C.C.R., Section 20410, Title 23, C.C.R., Section 2550.6	R&A	Groundwater will be monitored according to Title 27/Title 23 regulations	Progress of the remedy will be evaluated by monitoring the water supply wells & established sentinel wells.
State Regulatory Requirement	GW	California Safe Drinking Water Act - Title 22, Division 4, Chapter 15, Articles 4, 5.5, and 8.	R&A	The State has promulgated MCLs for some of the COC that are more stringent.	The cleanup level for a COC with a state MCL that is more stringent is set at the state MCL.
Federal Regulatory Requirement	GW	National Pollutant Elimination Discharge System (NPDES) Permit	Applicable	A discharge to surface water must comply with effluent and receiving water limitations.	Discharge to surface water on-site will comply with the substantive requirements of an NPDES Permit (See Table 2.15); discharge to surface water off-site will require an NPDES Permit.
Federal Regulatory Requirement	GW	USEPA Region 9 Preliminary Remediation Goals (PRGs)	Applicable as Performance Standard	USEPA has developed preliminary remediation goals that are risk-based levels that are used to screen sites that may require additional investigation or possible remediation. PRGs may also be considered in setting groundwater cleanup levels in the absence of promulgated MCLs for contaminants.	In the absence of MCLs for perchlorate and NDMA, the cleanup levels for these COC are based on risk levels. For NDMA, the cleanup level is the PRG. For perchlorate, the cleanup level is the low end of the risk range provided in ORD's 6/18/99 "Interim Assessment Guidance for Perchlorate using standard adult parameters."
Federal Regulatory Requirement	GW	USEPA Drinking Water Health Advisories and NAS Suggested No Adverse Response Levels (SNARLs)	Applicable as Performance Standard	USEPA and the National Academy of Sciences (NAS) published risk values for toxicity based factors other than cancer or incremental cancer risk estimates. USEPA and NAS published risk estimates for perchlorate.	The risk values for perchlorate published by USEPA and NAS were considered in establishing the cleanup level for perchlorate at the Site.
State Regulatory Requirement	GW	CA Water Code, Division 7, Section 13241, 13243, 13263(a), and 13360 (Porter-Cologne Water Quality Control Act)	Applicable	Authorizes State Water Resources Control Board (SWRCB) and Regional Water Quality Control Board (CVRWQCB) to establish in water quality control plans water quality standards for the waters of the State/Region (surface and groundwater).	The selected remedy complies with the applicable requirements in the Central Valley Region Basin Plan.

Table 2.16 - Description of ARARS for Selected Remedy

Authority	Medium	Requirements	Status	Synopsis of Requirements	Action to be Taken to Attain Requirements
State Regulatory Requirement	GW	Water Quality Control Plan for the Sacramento River and San Joaquin River Basins	Applicable	Those portions of the Central Valley Region Basin Plan which set out the designated uses (i.e., beneficial uses) and the water quality criteria based upon such uses are applicable requirements.	The designated use for the aquifer at the Aerojet Site is municipal and aquatic water supply. The cleanup levels for the Contaminated Groundwater comply with the water quality criteria based upon such use.
State Regulatory Requirement	GW	SWRCB Resolution No. 88-63 (Sources of Drinking Water Policy)	Applicable	Designates all ground and surface waters of the State as drinking water except where the Total Dissolved Solids (TDS) is greater than 3,000 ppm, the well yield is less than 200 gpd from a single well, the water is a geothermal resource or in a water conveyance facility, or the water cannot reasonably be treated for domestic use using either best management practices or best economically achievable treatment practices.	The aquifer under the Aerojet Site has been identified as a source of drinking water.
State Regulatory Requirement	GW	SWRCB resolution 92-49 (Policies and Procedures for Investigation and Cleanup and Abatement of Discharge (Water Code Section 13304 and 13307)	Applicable	Dischargers must cleanup and abate the effects of discharges in a manner that promotes the attainment of either background water quality, or the best water quality that is reasonable if background water quality cannot be restored.	Groundwater at OU-3 will be cleaned up to attain best water quality that is reasonable, e.g., 4 ppb for perchlorate and 1.3ppt for NDMA and at a minimum MCLs for VOCs. However, it is expected that as a result of the treatment for perchlorate and NDMA, VOCs will be cleaned up to below MCLs.*
* The Regional Water Quality Control Board, using the requirements established in Resolution No. 92-49 and the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, would set the cleanup values for cancer causing substances for OU-3 at the incremental 1×10^{-6} cancer risk value and not the MCLs. However, cleanup of perchlorate to 4 ug/l and NDMA to 0.0013 ug/l will likely reduce the other COC to below their respective incremental 1×10^{-6} cancer risk values.					
Location-Specific ARARs					
Federal Regulatory Requirement	Within 100-year flood-plain	40 C.F.R. Part 6, Appendix A, Fish and Wildlife Coordination Act (16 USC 661 et seq.), and 40 C.F.R. Part 6.302	Potentially Applicable	Require avoidance of adverse effects, minimization of potential harm, and restoration and preservation of natural and beneficial values of floodplains.	Constructing groundwater treatment facilities in a 100-year floodplain will be avoided. If it cannot be avoided, the potential harm to the floodplain shall be minimized.
Federal Regulatory Requirement	Within 100-year flood-plain	40 C.F.R. 264.18(b) and 22 C.C.R. 66264.18(b)	Potentially Applicable	A RCRA facility located in a 100-year floodplain must be designated, constructed, operated and maintained to prevent washout of any hazardous waste by a 100-year flood	Since the treatment facilities will generate hazardous waste, any facility constructed within a 100-year floodplain shall comply with this requirement.

Table 2.16 - Description of ARARS for Selected Remedy

Authority	Medium	Requirements	Status	Synopsis of Requirements	Action to be Taken to Attain Requirements
Federal Regulatory Requirement	Excavation of terrain which may cause irreparable harm, loss, or destruction of artifacts	National Archaeological and Historical Preservation Act (16 USC Section 469); 36 C.F.R. Part 65	Potentially Applicable	Alteration of terrain that threatens significant scientific, prehistoric, historic, or archaeological data may require actions to recover and preserve artifacts.	The proposed remedial alternatives will not alter or destroy any known prehistoric or historic archeological features west of the Aerojet Site. Areas west of the Aerojet Site are essentially completely developed. However, because there is always a possibility that buried historic or prehistoric remains could be discovered during construction, this regulation would require action to recover and preserve artifacts.
Federal Regulatory Requirement	Critical habitat upon which endangered species or threatened species depend	Substantive portions of the Endangered Species Act of 1973 (16 USC 1531 et seq.); 50 C.F.R. Part 200 and 50 C.F.R. Part 402 Substantive portions of the CA Endangered Species Act Substantive portions of the Native Plant Protection Act	Potentially Applicable	Requires action to conserve endangered species or threatened species, including consultation with the Department of Interior, Fish and Wildlife Service.	Two endangered floral species are known to occur within Sacramento County: the Sacramento Orcutt grass (<i>Orcuttia Viscinda</i>) and the Boggs Lake hedge hyssop (<i>Gratiola Heterospala</i>). Four endangered wildlife species are expected to occur within 25 miles of the Aerojet Site: Bald Eagle, Peregrine Falcon, Giant Garter Snake, and the Valley Elderberry Longhorn Beetle. The Aerojet Site may be a habitat for the Burrowing Owl, a species of concern in CA. Any action that may impact or threaten to impact an endangered species shall comply with this requirement.
Federal Regulatory Requirement	Wetlands	40 C.F.R. Part 6 Appendix A	Potentially Applicable	Actions must be taken to avoid adverse effects, minimize potential harm, and preserve and enhance wetlands, to the extent possible.	Could be applicable if treatment facilities are constructed off-site on a wetland. Any construction in wetland would avoid adverse effects, minimize potential harm, and preserve and enhance wetlands, to the extent possible.
State Regulatory Requirement	Wetlands	Fish and Game Commission Wetlands Policy (adopted 1987) included in Fish and Game Code Addenda	Could be applicable as a Performance Standard	Actions must be taken to ensure that “no net loss” of wetlands acreage or habitat value occurs. Actions must be taken to restore and enhance California’s wetland acreage and habitat value.	Any construction off-site would ensure that no net loss of wetlands or habitat value occurs.
Federal Regulatory Requirement	Areas affecting stream or river	Fish and Wildlife Coordination Act (16 USC 661 et seq.) and 40 C.F.R. Part 6 Section 302	Potentially Applicable	Restrictions on diversion, channeling or other activity that modifies a stream or river and affects fish or wildlife.	Applicable if treated water will be discharged to surface water. Discharge to surface water shall comply with these restrictions.
Action-Specific ARARS					

Table 2.16 - Description of ARARS for Selected Remedy

Authority	Medium	Requirements	Status	Synopsis of Requirements	Action to be Taken to Attain Requirements
Federal Regulatory Requirement	Generation of waste from construction & operation due to Remedial Action selected	40 C.F.R. Part 261 and 22 C.C.R. Section 66261	Applicable	Establishes procedures and numeric limits for identification and management of characteristic hazardous wastes, listed hazardous wastes, and State-only (non-RCRA) hazardous wastes.	These requirements are applicable to management of waste materials generated as a result of construction of the selected Remedial Action or operation of a groundwater treatment facility.
Federal Regulatory Requirement	Generation of waste from construction & operation due to Remedial Action selected	40 C.F.R. Section 262.11 and 22 C.C.R. Section 66262.11	Applicable	Requires waste generators to determine if wastes are hazardous wastes and establishes procedures for such determinations	These requirements are applicable to management of waste materials generated as a result of construction of the selected Remedial Action or operation of a groundwater treatment facility.
Federal Regulatory Requirement	Shipment of hazardous wastes for treatment or disposal off-site	40 C.F.R. Section 262.34 and 22 C.F.R. 66262.34	Potentially Applicable	Specifies maximum amounts and maximum periods for accumulation of hazardous waste on-site under generator status	These requirements are potentially applicable to management of waste materials generated as a result of construction of the Remedial Action and operation of any groundwater treatment facility if these waste materials are hazardous wastes.
Federal Regulatory Requirement	Discharge to inland surface water	National Toxics Rule, 40 C.F.R. Section 131.36	Potentially Applicable	Establishes the appropriate aquatic and human health criteria for toxic pollutants in inland surface waters and enclosed bays and estuaries. Included in the National Rule were EPA promulgated specific criteria for certain water bodies in California.	If treated water is discharged to surface water, the discharge shall comply with these requirements.
Federal Regulatory Requirement	Discharge to inland surface water	California Toxics Rule 40 C.F.R. Section 131.38	Potentially Applicable	Establishes numeric water quality criteria for priority Toxic Pollutants for inland waters in the state of California, the presence or discharge of which could reasonably be expected to interfere with maintaining designated uses.	If treated water is discharged to surface water, the discharge shall comply with these requirements.
State Regulatory Requirement	Discharge to surface water	SWB Resolution Nos. 68-16 and 92-49	Potentially Applicable	Allows for the use of mixing zones as part of a determination of whether water quality is being maintained in the receiving water.	This requirement is potentially applicable if treated water is discharged to surface water.
Federal Regulatory Requirement	Discharge to surface water	40 C.F.R. Parts 122 and 125 and 23 C.C.R. 2235 et seq.	Potentially Applicable	Establishes treatment and monitoring requirements for discharges to surface water.	Discharge to surface water on-site will comply with the substantive requirements of an NPDES Permit (See Table 2.15); discharge to surface water off-site will require an NPDES Permit.

Table 2.16 - Description of ARARS for Selected Remedy

Authority	Medium	Requirements	Status	Synopsis of Requirements	Action to be Taken to Attain Requirements
Federal Regulatory Requirement	Storm-water management	40 C.F.R. Part 122.26 and 23 C.C.R. 2235 et seq.	Potentially Applicable	Establishes monitoring and pollutant control requirements for stormwater from industrial activities	The substantive requirements would be applicable if construction activities associated with the Remedial Action disturb an area of 5 acres.
State Regulatory Requirement	Ground-water extraction and treatment	SWB Basin Plan (wastewater reuse policy)	R&A	Requires evaluation of potential water reuse options and identifies potential reuse options that should be considered prior to disposal of treated groundwater	This policy is relevant and appropriate in reviewing the options for reuse of the treated water.
State Regulatory Requirement	GW treatment waste generation	27 C.C.R., Division 2, Subdivision 1.	Applicable	Title 27 establishes waste siting classification systems and minimum waste management standards for discharges of waste to land for treatment, storage, and disposal.	Spent Granular Activated Carbon (GAC) will be classified and handled in accordance with Title 27 requirements.
Federal Regulatory Requirement	Organic waste generation into air	Article 27 Air Emission Standards for Process Vents (22 C.C.R. 66265.1030-66265.1035).	R&A	Applies to treatment, storage, and disposal facilities with process vents associated with solvent extraction or air or steam stripping operations managing RCRA hazardous wastes with organic concentrations of at least 10 ppm. These operations must reduce total organic emissions by 95 percent by weight.	The requirements are relevant and appropriate for groundwater extraction and air-stripping operations for the remedy.